The Schoolhouse

E. C. EARL

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The Schoolhouse

BY

EDWARD C. EARL

WASHINGTON, D. C.
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THE CALL TO THE SCHOOL.

TABLE I. POPULATION OF THE UNITED STATES.

CLASS OF COMMUNITY	TOTAL POPULATION		PERSONS 6 TO 20 YEARS OF AGE				
	NUMBER	PER CENT DISTRIBUTION	TOTAL NUMBER		NUMBER ATTENDING SCHOOL		
			NUMBER	PER CENT DISTRIBUTION	NUMBER	PER CENT	PER CENT DISTRIBUTION
RURAL	49 348 883	53.7	16 230 406	58.5	10 201 235	62.9	59
URBAN	42 623 383	46.3	11 520 193	41.5	7 098 969	61.6	41
TOTAL (U.S.)	91 972 266	100.	27 750 599	100.	17 300 204	62.3	100

TABLE II. ILLITERACY.

	TOTAL POPULATION 10 YEARS OF AGE AND OVER		ILLITERATE 10 YEARS OF AGE AND OVER		
	NUMBER	PER CENT DISTRIBUTION	NUMBER	PER CENT	PER CENT DISTRIBUTION
RURAL	36 931 095	51.6	3 748 031	10.1	68
URBAN	34 649 175	48.4	1 768 132	5.1	32
TOTAL	71 580 270	100.	5 516 163	7.7	100

STATISTICS FROM THE UNITED STATES CENSUS OF 1910.

TOTAL FOR THE UNITED STATES MEANS CONTINENTAL UNITED STATES NOT INCLUDING ALASKA AND ISLAND POSSESSIONS.

"URBAN" INCLUDES ALL COMMUNITIES OF 2500 POPULATION OR MORE.

TABLE III. INABILITY TO SPEAK ENGLISH.

FOREIGN BORN WHITE POPULATION 10 YEARS OF AGE AND OVER

	TOTAL NUMBER		NUMBER UNABLE TO SPEAK ENGLISH		
	NUMBER	PER CENT DISTRIBUTION	NUMBER	PER CENT	PER CENT DISTRIBUTION
RURAL	3 612 535	27.9	910 130	25.2	30.8
URBAN	9 331 994	72.1	2 042 881	21.9	69.2
TOTAL	12 944 529	100	2 953 011	22.8	100

TABLE IV. OCCUPATIONS.

POPULATION 10 YEARS OF AGE AND OVER ENGAGED IN GAINFUL OCCUPATIONS.

OCCUPATIONS	NUMBER	PER CENT DISTRIBUTION
AGRICULTURE, FORESTRY AND ANIMAL INDUSTRY	12 659 203	33.2
MANUFACTURING AND MECHANICAL INDUSTRIES	10 658 881	27.9
DOMESTIC AND PERSONAL SERVICE	3 772 174	9.9
TRADE	3 614 670	9.5
TRANSPORTATION	2 637 671	6.9
CLERICAL OCCUPATIONS	1 737 053	4.5
PROFESSIONAL SERVICE	1 663 569	4.4
EXTRACTION OF MINERALS	964 824	2.5
PUBLIC SERVICE	459 291	1.2
TOTAL GAINFULLY OCCUPIED	38 167 336	100
TOTAL POPULATION 10 YEARS OF AGE AND OVER	71 580 270	
PER CENT GAINFULLY OCCUPIED		53.3

E. C. E

THE SCHOOLHOUSE

SCHOOL GROUNDS
THE BUILDING
THE CLASSROOM
PLATES

SCHOOL GROUNDS

SITE.
SURROUNDINGS.
AREA.
ASPECT.
PLACING THE BUILDING.
PLAYGROUNDS.
PLANTING.

In choosing the grounds for the new schoolhouse, the people of the community have opportunity to write a testimonial to themselves of wisdom, forethought and high ideals, that will stand a monument for generations to come. Lest the many perplexing conditions may obscure the vision, let us tabulate some of our theories and embody as many as we can in our title to the new school grounds, and make all possible improvements in the old.

The Site.

The schoolhouse must stand on high ground, not on a hill, although its light must not be hid, but upon ground high enough to give good drainage and preferably the slope should be to the south or east. A rich natural soil, of a sandy or gravelly nature, is desirable. A clay soil, rough or rocky ground, a filled-in site, and a low or damp location should be avoided. Yet surfacing and drainage may do much to improve an uninviting tract. The site should be open to the sunlight, preferably a city block with wide, shady streets for the urban school and a place of similar character and of easy access, but of larger area, for the rural school.

An abundant supply of pure water is necessary. It is desirable that sewer, electric light, electric power and telephone should be available for school use.

School Grounds

Surroundings.

The schoolhouse should be in a quiet residential neighborhood, near the center of population, and in line with future growth. Nevertheless, aspect, soil sanitation and water supply are more important than geographic location. The school should, at least, be in a moral neighborhood and with no theaters or places of amusement nearby. It should be away from noise, traffic, street cars, hospitals, fire and police stations. It should be remote from stables and shops and from dangerous crossings. Fire and police stations may well be accessible but so far away that the noise and excitement do not reach the school. Nearby buildings are objectionable because of noise, fire hazard and obstruction to light and air.

Area.

Cost usually determines the size of the grounds and the larger the city school the smaller will be the area for each pupil. For a large city and with gymnasium and roof playgrounds, an unbuilt on area of even less than thirty square feet per pupil may be generous, while ten times that amount would be small for a country school. The boys' playground should afford ample space for a running track and for baseball and football. The girls' playground may be somewhat smaller but large enough for apparatus, basket-ball, tennis and running games.

In addition to the athletic field there should be a school garden and an experimental field. In front, there should be a lawn with flower borders and trees making a suitable place for picnics, and community gatherings on holidays and summer evenings. There should be at least three acres for every country school. Five acres should be a minimum where garden and field work is carried on and grounds of ten acres are none too large for consolidated rural schools.

Aspect

The sun exposure of the classroom is most important. But this has to do more with the planning of the building than with selection of the site, for the schoolhouse must be arranged with reference to the points of the compass. Generally, an east or south front is to be preferred to a west or north front, because the building is used in winter more than in summer. For the playgrounds, a slope to the east or south is desirable. The exposure should be such that the pupils will be tempted out into the fresh air and sunlight all thru the winter. Nearby forests and neighboring hills will be a welcome protection from the north and west winds, while such features, to the south or east, may be so objectionable as to prohibit the use of the site for school purposes.

Placing the Building.

Fronting on the principal street, with convenient side entrances, the schoolhouse will usually be set far enough back to afford a lawn with some planting in front and a short walk up to the building, while the playgrounds will be at the side and rear. But with noisy streets or with a southern slope from rear to front, it may be set well back and the playgrounds located in front. It is desirable but not necessary that the main entrance face the street. If the outlook, orientation or slope of the grounds make a different location desirable, the planting and design may be made to harmonize the building with the site.

Playgrounds.

The area of the playground will determine its use and treatment. Grounds of small area should be paved and drained to sewer. Paving may be of brick, cement, or asphalt, or of cinders or gravel well compacted; or better, of broken stone, surfaced with limestone screenings or torpedo sand. Walks for country schools may be made in any of these ways. For large playgrounds a few of the hardier grasses will stand the rough usage.

Well drained playgrounds, open to the sunlight and protected from north and prevailing winds, will keep the pupils out of doors many winter days. The playgrounds should be placed so as to be easily overseen by the teacher. Separate yards for boys and girls should be provided; for although they may play the same games, it is generally agreed that undirected co-recreation is not desirable. Some of the games that should be provided for are baseball, basketball and football. Some equipment adds greatly to the use of the playground and takes very little space. Sand bins will delight the smaller children. The slide and horizontal bars are good and generally safe.

It would be desirable to enlarge the use of the school playground. Make it a neighborhood center. Provide more apparatus and have an athletic field and a swimming pool. Make it a picnic grounds, a general gathering place, a place for athletic meets, moving pictures, band concerts and singing school.

Fence the grounds if large, and it is desired to shut out the things of the street. A high iron fence is expensive and agressively exclusive. A strong, close mesh woven wire fence, covered with roses, honeysuckle or ivy, is a thing of refinement, joy and beauty. Or trees and shrubbery alone may give the desired seclusion. Sometimes high masonry walls are desirable, as on the north or west sides of an exposed yard or to shut out some undesirable view or building. Such walls may be of stone, brick or concrete. Walls of field stone, laid up in cement mortar with large deep joints, are picturesque when half covered with vines. Walls of rough brick are also pleasing and concrete walls are good and structurally, perhaps the best. Shrubbery and trees should be planted along the inside of these walls and fences.

Planting.

Sunlight for building and grounds is all important. Open spaces for play is essential. The south breeze should not be shut out. What planting, then, is there to do? Two rows of shade trees may be placed along the street, one row in the parking and one inside the street walk. Also, trees may be planted along the property lines with a few extra ones in the corners. Some trees may be planted close for quick effect, such as silver maple and Carolina poplar, but the permanent trees,—elm, oak, sugar maple, sycamore and ash, should be given plenty of room.

Along the borders of the grounds plant lilacs, roses and other shrubs. Cover the fences with vines, let some Japanese ivy creep over the building and give the climbing roses, clematis and other vines a place at the entrances. Put some low bushes along the walks,—privet, roses and barberry. Cannas, dahlias and hardy chrysanthemums are fine for fall, and the early wild flowers, violets and the hardy bulbs will herald the approach of spring and give a touch of romance to the closing days of school.

Work out a good arrangement for the grounds and follow this plan even if the improvements extend over several years. Keep all planting in groups and masses. Scattered planting does not look well for shrubs, and usually not for trees, except for an occasional specimen that that seems to have broken away from the mass or stands a captain for its company. Trees, however, must often be planted alone because of the space they occupy and for special requirements of shade. Too many varieties should not be planted and every tree should be carefully selected from nursery or forest. But use the natural features if not interferring with the use of the grounds. A hill, a small ravine, a natural wood, the wild flowers, in their proper places, are assets to the school grounds. Save the oaks and pines, the dogwoods, elders, golden rod and creeping plants.

Grass seed mixtures adapted to the given soil and climate will produce fine lawns, if well cared for. Kentucky blue grass is good for the central and northern states. Bermuda grass is desirable for the South in open spaces.

Books for the School Library.

Manual of Gardening, by L. H. Bailey. N. Y., The Macmillan Co. ($2.00.)
Trees in Winter, by Blakeslee and Jarvis. N. Y., The Macmillan Co. ($2.00.)
Practical Landscape Gardening, by Robert B. Cridland.
N. Y., A. T. De La Mare Prtg. & Pub. Co. ($1.75.)
How to Make a Flower Garden. N. Y., Doubleday, Page & Co. ($2.00.)

SUGGESTED PLANTING LISTS FOR SCHOOL GROUNDS

DECIDUOUS TREES

COMMON NAME.	BOTANIC NAME.	HEIGHT FEET.	DISTANCE APART, feet.	Relative rapidity of growth	RANGE.	Time of Blooming.	SOIL.	HABIT.	REMARKS.
American Elm	Ulmus americana	50-100	50	3	Eastern N.A. to Fla. Tex. & Dak.	March-April	Any good pref. moist	Head broad, inversely conical. Branches drooping.	Long lived; easily transplanted. Best of all shade trees, but subject to insects.
Sugar Maple	Acer saccharum	50-90	45	6	Eastern U.S. west to Minn. & Tex.	April-May	Rich, moist - not wet.	Head, close, oval or round. Branches, erect.	Long lived, will grow in shade. One of the best ornamental trees.
Red Oak	Quercus rubra	50-85	45	7	Eastern N.A. Canada to Ga.	May-June	All, except very wet.	Head close. Trunk, straight Many branched.	Most beautiful & best grower in more varied situations than other oaks. In oak transplants better.
Sycamore	Platanus occidentalis	50-100	45	4	N.E. south & west.	May	Any good, pref. rich & moist.	Head, open. Trunk, straight or divided. Scraggly branches.	Good specimens, very beautiful. Oriental Sycamore. Said to be better grower, better shaped & more hardy.
American Beech	Fagus grandifolia	50-70			Eastern U.S. & Canada.	April-May	Pref. cool moist limestone soil	Head, round, dense. Many branched.	Will grow in shade. Some desirable purple leaved varieties. Transplant young trees only.
Tulip Tree	Liriodendron tulipifera	50-70	50	5	N.E. to gulf, w. to Wis. & Ark.	May-June	Rich, loamy, moist.	Tall straight continuous trunk. Pyramidal to oblong head	Long lived, not susceptible to insects. Majestic & ornamental in flower & foliage, but dif. to transplant.
White Birch	Betula alba	50-75			Penn., Ills. Wash. & North.	April-May	Rich.	Head open irregular. Varieties erect, drooping & weeping.	White bark; pleasing habit. Will not grow in shade.
White Ash	Fraxinus americana	50-75	45	8	Eastern N.A.	May-June	Rich, moist	Head close, spreading. Trunk straight, or low & equally branched.	Long lived. Subject to insects. Not specially desirable.
Carolina Poplar	Populus deltoides var. caralinensis.	60-80	30	1	Widely distributed by nurserymen.	April	Any good	Head, open pyramidal	One of the best shade trees for quick effect. Best tree where subject to city smoke.
Silver Maple	Acer saccharinum	50-60	45	2	Eastern U.S.	March-April	Rich pref. moist	Large branched, wide topped Small branches drooping.	One of the best quick growers. Free from disease, but not long lived.

EVERGREEN TREES

Hemlock	Tsuga canadensis	50-80			Canada to Ga. & west.	April-May	Moist, rich, well drained.	Head conical. Trunk straight. Branches horizontal.	Most graceful of evergreens, generally hardy. Slow grower. Easily transplanted, will grow in shade.
Norway Spruce	Picea excelsis	50-100			Native of Norway Widely pld in N.Y. U.S.	April - May	Any good, pref. cool, moist, sandy	Head, conical. Trunk straight. Br. close, horizontal or drooping.	Very hardy. Quick grower. Ornamental alone or as hedges & windbreaks.
White Pine	Pinus strobus	50-80			Canada to Ga.	June	Fertile; moist or dry.	Head, pyramidal, open. Trunk straight. Branches, horizontal	Long lived; good grower. Ornamental when young. May be grown with hemlock.

SHRUBS

Japan quince	Cydonia japonica	3-6		COLOR OF FLOWERS Red	March-April	Any good	Stout thorny branches	Vigorous, hardy. One of the best shrubs. Fine for hedges.
Barberry	Berberis thunbergii	2-5		Yellow	April - May	Any - Sun or shade.	Compact; spreading.	One of the best shrubs. Vigorous hardy. Fine for hedges. Scarlet berries thru winter.
Lilac	Syringa vulgaris	4-10		White, lilac, purple	April-May	Any good pref. rich, moist.	Erect; branching	Most popular of shrubs; vigorous, hardy. Easily transplanted. Profuse fragrant flowers. Many varieties.
Spirea	Spirea van houttei	5-8		White	May-June	Any, pref. moist	Arching branches.	Vigorous, hardy; profuse bloomer. "S. thunbergii prettiest of Spireas." (Parsons)
Snowball	Viburnum opulus americanum	4-10		White	May-June	Good, moist	Erect; somewhat open & spreading.	Brilliant foliage in autumn. Red berries thru winter. V. lantana also good
Honeysuckle	Lonicera tatarica	5-6		White, rose, pale purple	April-June	Good. Sunny position.	Upright; spreading.	Hardy; easily cultivated. Showy, fragrant flowers. Several varieties.
Dogwood (White fruited)	Cornus alba	5-10		White, cream		Any good	Erect. Slender branches	Hardy: grows in sun or shade. Red twigs and stems.
Japanese rose	Rosa rugosa	3-6		White & pink	May-Sept.	Any good.	Slender, arching branches	Hardy. Ornamental all seasons. Fragrant single or semi-double flowers. Several varieties.
Mock orange	Philadelphus coronarius	8-10		White	May-June	Rich, moist	Erect.	Vigorous hardy. Fragrant flowers "Handsomest of all cultivated shrubs."
Hydrangea	Hydrangea paniculata grandiflora.	4-6		White to pink	Aug.-Sept.	Rich, moist.	Erect; branching; drooping flower heads	Hardy: ornamental foliage; flowers in large panicles. Grows in sun or partial shade.

CLIMBING VINES

Boston Ivy	Ampelopsis veitchii.	Requires some sunlight	Greenish (small)	June-July	Good.	Woody-surface clinging	Best self supporting vine for walls. Hardy when established. Rapid grower.
Climbing Roses Crimson rambler Dorothy Perkins	Rosa multiflora. Rosa wichuriana.	Dorothy Perkins best pink climber. Perfect	Crimson. White.	Summer	Good	Woody-not self supporting	Vigorous, hardy.
Honey Suckle. Halls.	Lonicera halliana.	Half ever-green	White to yellow.	June-Sept.	Good.	Woody, trailing	Vigorous grower. Fragrant flowers
Bittersweet Japanese.	Celastrus orbiculatus.	A dense grower.	Greenish-white.		Any - Sun or Shade.	Woody, twining.	Rampant grower, beautiful foliage & berries. Inconspicuous flowers.
Akebia	Akebia quinata	A good porch vine.	Purplish.	April	Good well drained Pref. Sandy sunny loc	Woody, twining.	Hardy, rapid grower: fine foliage, not dense. Free from insects. Fragrant flowers.

Bee

THE BUILDING

ESSENTIALS.
COURSE OF STUDY.
SIZE OF BUILDING.
THE BASEMENT.
MATERIALS.
LIGHTING.
A SOCIAL CENTER.

The greatest needs of city schools are larger grounds and more buildings of the best modern type. The greatest needs of country schools are larger and better kept grounds, better buildings, better sanitation and better equipment. The rural schoolhouse should be attractive in appearance and may well reflect the home in its design, while, as an institution of learning and discipline, its plan should insure the greatest efficiency in operation. The more extensive use of the schoolhouse for social and community meetings of an educational character and the teaching of agriculture, manual training and household science, are developing a new schoolhouse plan in which the workroom and library are used to supplement the work of the classroom, and an assembly room is provided for general public use.

Essentials.

Every school building should be safe, sanitary, comfortable; well lighted, heated and ventilated; carefully planned, economically and honestly built; of durable materials; of minimum cost for upkeep; perfectly adapted to its purpose, and beautiful in appearance. To be safe a school building need not be fireproof, but it should, at least, be fire resisting, slow burning, and easily and quickly emptied. One-story buildings may safely be of wood. Two-story buildings should have all exterior walls and carrying partitions, all stairways and all corridor floors of non-burning materials. Three-story buildings are undesirable for grade schools. If built, they should be entirely fireproof. All roofs should be covered with non-burning materials. Heating rooms should be safeguarded against fire and should be shut off from the remainder of the building by fire-resisting and fireproof construction. Ample inside stairways should be provided to empty the building in not to exceed three minutes. Outside iron stairways are undesirable because pupils will not be sufficiently accustomed to their use.

Course of Study.

The training of the child is provided for by the school (a) in the classroom, auditorium, library and study, where he receives individual and collective instruction, makes use of the sources of literary knowledge and learns to think for himself; (b) in the drawing room, laboratory, shop and garden, where he trains his hand, makes real his knowledge and learns to do by doing; and (c) in the gymnasium, and on the playground, where he invigorates his body, refreshes his mind and lays a foundation for future mental and bodily vigor. The classroom is the unit and nucleus for all this, and however important the other equipment may be, our system of training makes this feature the basis of grade school design.

Size of Building.

The number of classrooms determines the size of grade school buildings. Educators generally agree that a teacher should have not more than thirty pupils. But recognizing the difficulty of maintaining this standard, they place the practical limit at thirty-five pupils and believe that the ultimate or emergency limit should be forty. Considering the physical well being of the child, the floor area for each pupil has been established at 15 to 18 square feet and the cubic feet of air space at 200 to 225. These requirements will be fulfilled by a classroom having a floor area 20 to 23 feet by 27 to 32 feet and a ceiling height of 12 feet or 12 feet 6 inches. A classroom 25 by 32 feet has been found to be about the practical limit of voice and vision for teacher and pupils, and these dimensions with a ceiling height of 12 or 13 feet are near the limit for satisfactory lighting with windows on one side only of the room. The Boston standard is 23 by 29 feet for lower and upper elementary grades and 26 by 32 feet for junior high schools, with ceiling height of not less than 12 feet.

It will frequently be desirable to make additions to the school building as the population increases. This may be provided for in planning the building, yet to do so will often mean the sacrifice of some desirable feature of plan or design and larger cost, eventually, for the completed building. Or the entire building may be constructed, leaving some rooms to be equipped later; using them, until needed for classrooms, for some of the secondary functions of the school. However, there are several types of buildings which may be added to as the needs of the community require.

The Basement.

The basement is not only necessary for larger school buildings, but is also essential to the highest efficiency of one-room rural schools. It is the most desirable place for the heating apparatus, because a basement furnace affords a better distribution of heat over the whole building and is more safe, cleanly and convenient than the jacketed stove. The basement is a satisfactory

place for toilets where water supply and sewerage system are available. It is usually the only place for playrooms and may be used for manual training and domestic science when it is high and well lighted.

Basements that are dark, damp or poorly ventilated are not desirable. With a cement floor not more than four feet below grade and ceiling not less than five feet above grade, a basement in a dry, well drained soil should be sanitary, but for workrooms it would be better not more than two or two and one-half feet below grade. The walls may be of concrete with cement plaster inside or with face brick or paving brick wainscot or of selected common brick, carefully laid. Outside, the walls should be kept dry with cement plaster, or asphalt coating or with cinder or gravel fill and with tile drains.

A basement makes the rooms above dryer, warmer and more free from ground air. The increased cost should not prohibit the use of basements in rural school buildings.

Materials.

In schoolhouse construction the best is the cheapest and safety, fitness and service should be the first considerations, then beauty and cost. Materials and methods of construction will be largely influenced by local conditions. For foundations, concrete, stone, or hard-burned brick may be used; preference being given in the order named. A good foundation may be built of brick with cement mortar and with waterproofing on the outside. Brick walls above grade are permanent, will require no repair or paint and even common brickwork may be made attractive with selected brick and good workmanship. For small buildings, outside plaster on common brick or tile, is desirable, pleasing and not expensive. Small frame buildings may be made safe by firestopping with brick or other non-burning materials. Plaster is the best inside finish for walls and ceilings. Brick walls may be furred inside with hollow tile or faced inside with hollow brick and the plaster applied directly to the wall without lath or open furring space. However, hollow bricks even with damp proof paint, do not make a sufficiently dry wall. Metal lath on metal furring is expensive. Wood furring and wood lath keep the plaster dry and add little to the fire risk when properly firestopped.

Basement floors should be of cement. Corridor floors, where fireproof, may be of composition, cement, asphalt, marble, tile or mosaic. Cement is the cheapest and is satisfactory. Marble, tile and mosaic tile in patterns, are more pleasing than cement but somewhat more noisy. They are clean, non-absorbent and durable. Wood floors, although not perfectly sanitary, are best for classrooms and offices. Selected maple or quarter-sawed yellow pine, 2½-inch face, are satisfactory. The former is the better and is the more expensive. Composition floors on wood sub-floors are sanitary and especially desirable for corridors and toilets of frame buildings.

For wainscoting, cement plaster painted two or three coats, makes a good finish. Burlap, painted, is often used, and has the advantage that it is not easily marred. It is not, however, entirely sanitary. Face brick for corridor wainscoting is unsatisfactory, but is appropriate for basement playrooms. The least possible wood trim should be used and this preferably plain and so arranged as to catch the least amount of dust and be easily cleaned. Wood wainscot and wood partitions should be avoided.

Lighting.

Whenever possible, electric lighting should be provided throughout the school building. Some form of artificial illumination is essential, for the value of the building will be greatly lessened if it cannot be used at night. Especially should there be artificial lighting in vestibule, corridors, stairways and assembly room. For electric lighting all wires should be in steel pipe and generally the best work should be required. For classrooms and assembly hall as well as library and study, indirect lighting is much to be preferred to direct lighting. Opal bowls, transmitting the same brilliancy of light as that reflected from the ceiling, give a soft pleasing light very restful to the eyes. Indirect illumination, however, requires about fifty per cent more electric current to give the same amount of light.

A Social Center.

'A community may be said to have a schoolhouse social center if one of its school buildings is open to the public on one or more fixed nights in the week for at least twelve weeks a year, for activities of a social, recreational, or civic character and regularly directed by one or more trained leaders" (C. A. Perry). The present day tendency to make the school a factor in the social welfare of the whole community, is not a new movement but is a continuation and expansion of the spelling match, singing school and political meeting, in the little red schoolhouse, long ago, when folks really were neighbors and not as worldly-wise as now. We are trying to get back some of the good old times.

The location and purpose of the schoolhouse make it the logical place for community gatherings of an educational character; for debates, oratorical contests, athletic meets and public playground activities; for lectures, dramatic and musical entertainments; for meetings of parent-teacher associations, mothers' clubs, girls' clubs and boy scouts; for agricultural exhibits and discussions; for political meetings and voting places. Its use for these various purposes is justified on the ground that the school belongs to all the people, that it is well equipped for these different uses, and that its non-use is a loss to the community. To provide for these secondary functions but little extra expense is

involved. An auditorium is necessary and is provided for by the classroom and assembly hall. Adequate artificial lighting is necessary. Movable furniture is desirable. The larger and better equipped the gymnasium or playroom and playground the greater will be their service.

However better than all this would be an evening study room and clubroom for the boys. With proper supervision its effect for good would be immediate and far reaching.

Reference Books.

American Schoolhouses, by Fletcher B. Dresslar.
United States Bureau of Education, Bulletin No. 5. 1910.
Gov't Printing Office, Washington, D. C. (75c.)
Rural Schoolhouses and Grounds, by Fletcher B. Dresslar.
United States Bureau of Education, Bulletin No. 12. 1914.
Gov't Printing Office, Washington, D. C. (50c.)
School Buildings and Equipment, by L. P. Ayres and May Ayres.
Address, The Russell Sage Foundation, New York City. (25c.)
Healthful Schools, by May Ayres. N. Y., Houghton, Mifflin Co. ($1.50.)
Decoration of the School and Home, by Theodore M. Dillaway.
Springfield, Mass., Milton Bradley Company. ($2.00.)
Community Center Activities, by Clarence A. Perry.
N. Y., The Russell Sage Foundation. (35c.)

STATE LAWS RELATING TO SCHOOLHOUSES.

STATE	PLANS APPROVED BY	SQ. FEET PER PUPIL	CU FEET PER PUPIL	CU FT FRESH AIR PER PUPIL	RATIO FLOOR TO GLASS	TEMPERATURE	HUMIDITY	LIGHTING		EXIT DOORS OUTWARD	
Alabama	State Supt.										
Indiana			225.	30	6.	70°	40%	Left			Except one story
Kansas	State Architect										Except one story
Louisiana	Parish Supt. State									All schools	
Maine	State Supt.									All schools	
Maryland	County School Commissioners										
Mass.										All schools	
Montana	State Bd. Health State Supt.										
New Hamp.										All schools	
New Jersey	State Bd. Education	18	200.	30	5.				Left and rear		Except one story
New York	Com. of Education	15	200.	30.						All schools	
N Dakota	State Supt.										
Ohio		16-18-20	200-225-250		5.			Left	Left and rear		
Penn.	State Bd Education										
Rhode Island										All schools	
S. Dakota	State Supt.										
Texas	County Supt			30.	6			Left		All schools	
Virginia	Division Supt	15	200	30				Left	Left and rear		
Wisconsin											Except one story
S Carolina	State Bd Education										

From "Digest of state laws relating to public education, in force January 1, 1915." Bulletin No. 47, 1915. E. E. E.
Bureau of Education; Washington, Government Printing Office.

THE CLASS ROOM

SIZE OF ROOM.
ORIENTATION.
LIGHTING.
DOORS.
WARDROBES.
BOOKCASES AND CLOSETS.
BLACKBOARDS.
FURNITURE.
DECORATION.

In the modern schoolhouse the classroom is lighted from one side only, a constant supply of fresh air is maintained, a part, or all, of the desks and seats are adjustable, slate blackboards are provided on two or three sides of the room, and there is no teacher's platform.

Size of Room.

There is no absolute standard size for classrooms, but educators and hygienists have agreed upon certain limitations. They agree that a grade classroom should not be larger than 25 by 32 feet, and that one teacher should not, under any circumstances, have charge of more than forty pupils. It is also generally agreed that each child should have not less than fifteen square feet of floor space. And yet our largest cities continue to build larger classrooms and teachers in city and country continue to enroll forty-five and fifty pupils. But it is a passing condition. Every year better conditions become average conditions. It is likely that the lower standards will not continue beyond our present transition period.

Large classrooms, with movable furniture, may be useful as public assembly rooms, but in general the best interests of the pupil should not be sacrificed to any of the secondary functions of the school building. The classroom in most favor at the present time has five rows of seats and six, seven or eight seats in the row, seating thirty, thirty-five or forty pupils and requiring a room from 20 to 23 ft. wide, 27 to 32 ft. long and 12 ft. high.

The necessary ceiling height of a classroom is largely determined by light conditions, and this by orientation, surroundings, and geographic location. With classroom lighting from one side only, the width of the room should not exceed

two times the height of the top of the windows above the floor. Allowing six inches for head casing the top of the windows will be 11½ ft. above the floor for a room having a ceiling height of 12 ft. and the room should, accordingly, be not more than 23 ft. wide.

Increasing the ceiling height affords better lighting and somewhat more uniform temperature. But an increased ceiling height makes the room more difficult to heat, increases the amount of stair climbing to the story above and adds to the cost of the building. With perfect mechanical ventilation, giving thirty cubic feet of fresh air per minute to each pupil the area of floor and cubic feet of space per pupil become of much less importance.

Orientation.

With unilateral lighting, the most desirable outlook for the classroom is southeast or east. Next to an eastern exposure, west is preferable; then northeast, south, southwest and northwest, with north the least desirable. Local conditions as to site, sunlight and prevailing winds, may modify this choice but there should be direct sunlight in every classroom some part of the day. East rooms receive enough sunlight to be sanitary but not so much as to cause eyestrain. The morning sun helps to warm the room and is more welcome than sunlight in the afternoon. However, west exposure for the classroom has two minor but not unimportant advantages, namely, the sun is in the rear of the pupils and in studying geography the compass points of the pupil are the same as the map upon his desk.

South rooms are more open to the summer winds and better protected from winter storms than north rooms. They are most sanitary and cheerful but unsatisfactory because of unequal distribution of light. North light is most even and least trying on the eyes but north rooms are cold, cheerless and insanitary. If a schoolroom with a north exposure receives sunshine in the afternoon from high windows in the rear, it is to be preferred to a room with a south exposure.

Lighting.

Light for writing and drawing should come over the left shoulder from high windows in order that no shadow may be cast by the hand upon the work. Reflected light and cross lights cause eyestrain. It has become the best accepted practice to light classrooms from one side, and nearly all modern classrooms have windows at the left side only of the pupils.

There are many dark days when it would seem that light from rear windows would be sufficiently diffused to be welcomed even by the teacher facing these windows. There are many warm days when all possible ventilation is desirable. Bilateral lighting will produce cross shadows, hence windows at the left side should be large enough for lighting and rear windows should be

used only for exceptionally dark days, for ventilation and for sunning out rooms. In the south and southwest, especially, these rear windows should be provided for ventilation wherever the plan of the building will permit.

Opaque shades at rear windows and more transparent ones at side windows can be adjusted to meet the requirements of varying lights. Shades may be fastened at top and bottom of windows, double shades may be provided at meeting rails and arranged to pull up and down, or a single adjustable shade may be used.

Window heads should be square for greatest efficiency and as close to the ceiling as practicable. To avoid eyestrain from direct and reflected light, window stools should be above the heads of pupils when seated. But to get sufficient light with windows on one side only and with a 12-ft. ceiling, 3 ft. 6 ins. will be about as high as the window stools can be placed without it being necessary to extend the windows too far towards the front of the room. Windows should be grouped together as closely as possible to avoid cross lights. Large mullions and transom bars should be avoided. Splayed plaster jambs will help the lighting.

The area of glass required depends upon orientation, surroundings and climate. Under very favorable conditions the glass surface need not be more than one-sixth of the floor area. For rooms with a northern exposure, or with light partially shut off by other buildings and in places where many cloudy days may be expected, a ratio of one to four should be provided, while one-fifth of the floor area may be assumed as a fair standard for lighting of rooms having east or west exposure and with average climatic conditions.

Doors.

There is a difference of opinion as to the proper opening of the door between classroom and corridor. With the intention of emptying the room as quickly as possible, in case of fire, this door is sometimes made to swing out into the corridor. However, the danger from fire is more imaginary than real and if the teacher can control the pupils, allay their fears and march them out in an orderly manner, the danger is reduced to a minimum. This can better be accomplished by having only one corridor door to the classroom and this opening into the room. Such an arrangement with one, or possibly two doors between classroom and cloakroom, gives the teacher the best possible supervision over the pupils at all times. It follows that doors between corridor and cloakrooms are not desirable. In small buildings the classroom doors may open out, for, even if the pupils get beyond control, there is but little danger of congestion at the exits.

The door between corridor and classroom should be at the front end of the room wherever possible. It should be 3 ft. or 3 ft. 4 ins. wide. For safety and convenience it is desirable to have communicating doors between adjoining classrooms. It seems to be the best practice to have no glass in classroom doors and no transoms. With outside windows in rear of classrooms, no high corridor windows or transoms should be necessary for ventilation; otherwise they may be desirable for ventilation, or they may be necessary for lighting the corridor.

Wardrobes.

For grade schools one cloakroom is usually provided for each classroom, the two rooms being connected by one or two doors. For high schools, the two sexes should have separate cloakrooms and the same is true for the older pupils of country schools.

Wardrobes and cloakrooms are built in many different forms but unless a thoro system of mechanical ventilation is provided, there is probably no better way of taking care of pupils' hats and wraps than in the usual cloakroom at one end of the classroom. It should be 5 ft. or 5 ft. 6 ins. wide, have outside light and air and be provided with heat and artificial ventilation. The wardrobe should be under the direct supervision of the teacher. For this reason the cloakroom had better be at the teacher's end of the room.

With perfect mechanical ventilation, the built-in wardrobe, with sliding panels in front, of wood or slate, is economical of space and perhaps as sanitary and satisfactory as the cloakroom. It is placed at the rear or side of the classroom.

Sometimes the coatroom is partitioned off from the front end of the classroom, with no doors between. This has been carefully worked out for the Cleveland schools and has proven efficient and satisfactory for large buildings, but is not to be used except with perfect mechanical ventilation. There is little to be gained by using corridor space with low partitions, for coatrooms, because the corridors must be made correspondingly wider and will be less attractive with such inclosures.

Lockers in the corridors, even if built into the walls, do not look well, are insanitary and cause congestion and disorder. If lockers are used they should be heated and ventilated in order to dry and air wet clothing.

Cloakrooms should be provided with poles or shelves on all walls and with hooks and pins for hats and clothing. Hooks may be placed in two rows, 12 ins. to 18 ins. apart in each row,—giving forty or fifty hooks in a room. A heavy wire shelf may be placed a foot above the floor for overshoes. Such a shelf for hats and lunch baskets could be kept clean more easily than a wood shelf. An umbrella rack should be placed in each cloakroom. A lavatory, near the window, would be a valuable addition to the equipment.

Bookcases and Closets.

A bookcase and a teacher's closet should be provided for each classroom. The closet is especially desirable where there is no teacher's room. The built-in bookcase is more convenient and less in the way than the revolving case or the book cabinet. The Boston standard bookcase is about 5 ft.. 9 ins. long, and 7 ft. high, with cupboard and drawers below, 15 to 20 inches deep. These come up to the line of the bottom of the blackboard. Above are six adjustable shelves inclosed by glass doors.

Blackboards.

For blackboards slate is to be universally recommended. It is serviceable, durable and easily cleaned. It comes in standard widths, 3, 3½ and 4 feet high and ¼ to ⅜ inches thick. Prepared slate cement is satisfactory. It costs less than slate but is not as durable. It is applied like ordinary plaster to metal lath with wood backing. Pulp board is cheaper and more easily applied, but will buckle and is not durable. Liquid slating is applied to plaster, wood or pulp board. It requires frequent renewals and is not used except for the cheapest work. Ground glass, painted on the back, makes the best of blackboards, but is too expensive for common use. Painted glass, of some light color as buff or gray-green, and dark crayons, would give a much better color and lighting effect to the room. The most usual color for blackboards is dull black. A slight shade of green is pleasing and is frequently used.

Blackboards should be placed at the front and rear ends of the classroom and on the side opposite the windows. It should be 4 ft. high and 3 ft. above the floor for end walls. For one-room rural schools it should be 3½ ft. high and 28 ins. above the floor for side wall. For graded classrooms the height above the floor at side wall should vary with age of pupils,—25 inches for grades one and two, 27 inches for three and four, 30 inches for five and six, 32 inches for seven and eight and 36 inches for high schools. (Dresslar.) The height of the blackboard may be 30 inches for grades one to four, 36 inches for grades five to eight and 42 inches for high schools. The Boston standard height for blackboards is 4 ft. placed 26 to 30 inches above the floor for grades one to four and 32 inches for grades five to eight.

A tack board of soft wood or cork board, about one foot high, for pictures, should be placed above the blackboard, especially for primary grades. In the Boston classrooms, the rear end of the room from baseboard to height of top of blackboard is covered with cork carpet attached to soft wood sheathing. Blackboards are used at front and one side only. The remaining wall space to top of blackboards is covered with burlap, painted.

Furniture.

Notwithstanding the fact that adjustable and movable seats and desks are admittedly the best furniture for classrooms, nearly all schoolhouses are still provided with fixed desks and the majority are without adjustable furniture of any kind. The single fixed desk and seat is used. It is in one piece but of varying sizes and fits the body comfortably. It meets the requirements of the present rigid school discipline. Some educators believe that the methods of the sub-primary (kindergarten), workroom and laboratory are better suited for classroom instruction than our present system derived from the lecture room. The furniture required would be chairs and tables and would have many of the advantages over fixed desks that the movable armchair has. That is, the schoolroom may be quickly cleared for cleaning, for various school exercises and for use by the public.

The teacher's platform is now seldom provided. It is in the way and is not needed with the classroom of ordinary size.

Decoration.

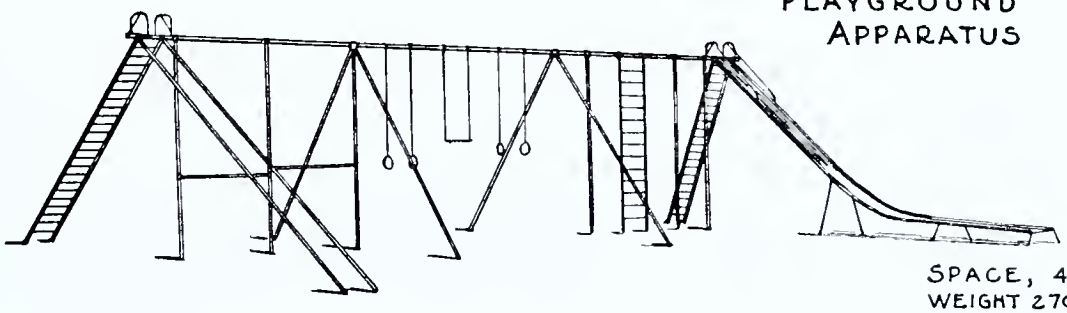
Dull finish and subdued colors should be the keynote for interior decoration of the schoolhouse. The classroom, especially, because of the many hours spent within its walls, should be carefully studied for color harmony and light requirements. Surfaces which reflect the light, as varnished furniture and glossy woodwork, will cause eyestrain. Bright colors, as red and orange, weary the eye and fatigue the brain. Blackboards are neither decorative nor cheerful and, being on the wall farthest from the windows, they absorb light where it is most needed.

Exposure and lighting of the schoolroom and color of the furniture, if already in place, will determine the decorative color scheme. For light rooms, gray and gray-green are appropriate; while darker rooms should have warmer colors, as light tan, buff, and light cream for ceilings. The furniture and woodwork should be simple in design and with dull finish. A brown stain is a suitable finish in north rooms and gray stain in rooms receiving more sunlight. Window shades should transmit light without glare and should harmonize in color with the walls. They should be selected with greatest care both as to color and transparency. Light green, light sage color and light cream color have been recommended.

In Cleveland the standard finish in classrooms is, for desks and chairs, a brownish dull stain; for woodwork, a dark dull finish; for walls, French gray below and creamy gray above; for ceilings, a color just off white. More color is given north rooms than south rooms. Blackboards are of natural slate color.

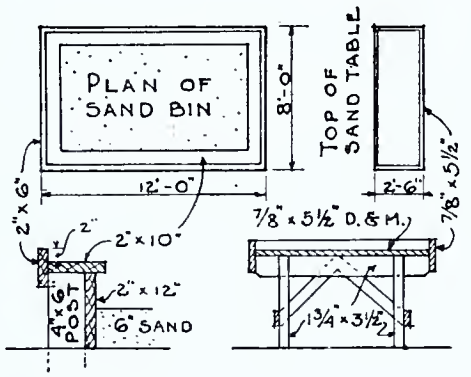
PLATES

PLAYGROUND APPARATUS



INCLINED LADDER
SLIDING POLES
HORIZONTAL BARS
FLYING RINGS
TRAPEZE
CLIMBING POLES
FLEXIBLE LADDER
VERTICAL LADDER
LONG SLIDE.

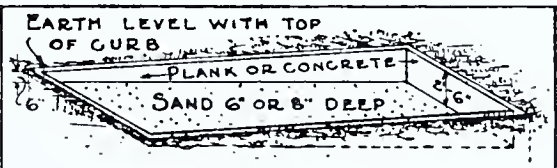
SPACE, 43'×36' HEIGHT 14'
WEIGHT 2700# COST ABOUT $325



SECTION THRU SIDE OF BIN — SECTION THRU TABLE

SAND BIN AND TABLE.

THESE MAY BE OF ANY DESIRED SIZE. HAVE ENOUGH BINS TO ALLOW SAND TO DRY AND AIR. ALL LUMBER TO BE DRESSED AND PAINTED.

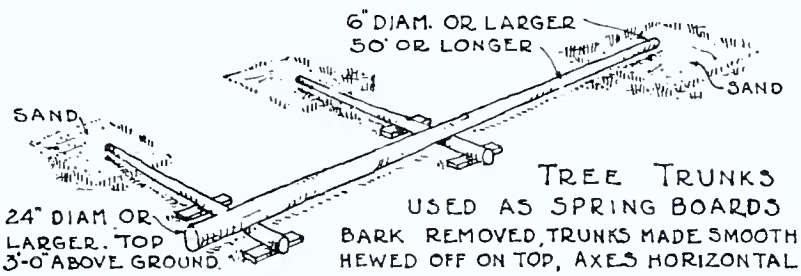


THE JUMPING PIT

SIZE 10'×30' OR LARGER. FOR THE RUNNING JUMP THE SAND SHOULD BE EVEN WITH SURFACE OF GROUND AND NO CURB USED, SIZE 8'×30' OR LONGER.

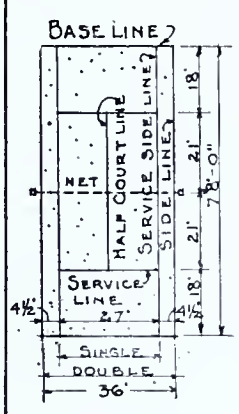
THE SAND HILL

AT LEAST 3' HIGH, FOR JUMPING POLE VAULTING AND GAMES OF WAR.

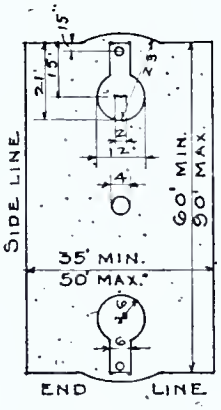


TREE TRUNKS

USED AS SPRING BOARDS
BARK REMOVED, TRUNKS MADE SMOOTH HEWED OFF ON TOP, AXES HORIZONTAL.



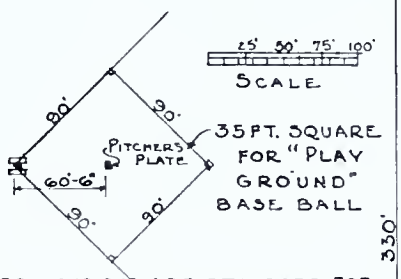
TENNIS



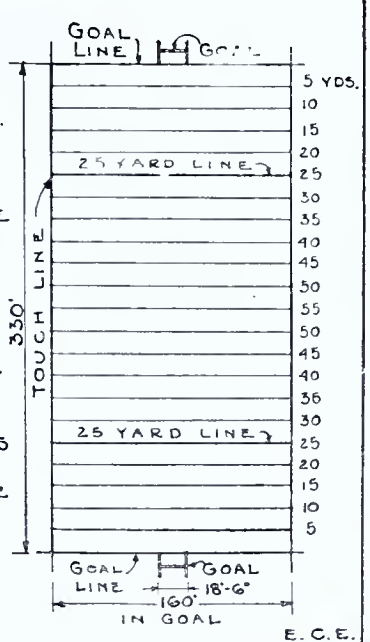
BASKET-BALL

FOR BIBLIOGRAPHY OF PLAY SEE "SOURCES OF INFORMATION ON PLAY AND RECREATION BY HANMER AND KNIGHT, N.Y. RUSSELL SAGE FOUNDATION. PRICE 10¢
ALSO CONSULT THE PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA, NO.1 MADISON AVE. N.Y. CITY. THEIR WORK IS PLAY.

THE DIAMOND AND GRIDIRON



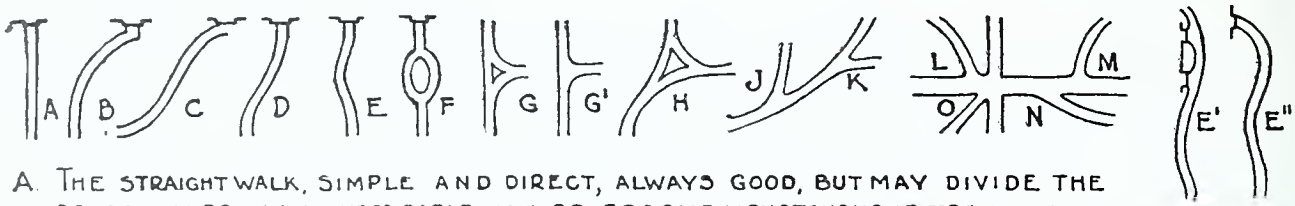
THESE DIMENSIONS ARE STANDARD FOR COLLEGE AND PROFESSIONAL GAMES. SCHOOL REQUIREMENTS WILL VARY WITH AGE OF PLAYERS. BUT THE DIAGRAMS ILLUSTRATE THE NEED OF LARGE SCHOOL GROUNDS. IF ALL PUPILS ARE TO BE PARTICIPANTS AND NOT ONLOOKERS MORE THAN ONE BALL FIELD MAY BE NECESSARY AND EVERY PART OF THE SCHOOL GROUNDS USED.



E.C.E.

SCHOOL GAMES | THE SCHOOLHOUSE | PLATE I.

FORMS GOOD AND BAD FOR WALKS AND ROADS.



A. THE STRAIGHT WALK, SIMPLE AND DIRECT, ALWAYS GOOD, BUT MAY DIVIDE THE SCHOOL YARD IN AN UNDESIRABLE WAY OR BECOME MONOTONOUS IF TOO LONG.

B. THE SIMPLE CURVE, GIVES VARIETY AND CHARM, USED TO AVOID OBSTACLES AND TO GIVE A DESIRED LANDSCAPE SETTING. MUST NOT BE OF TOO SMALL RADIUS. MAY NOT BE DIRECT ENOUGH FOR SCHOOLYARDS.

C. THE DOUBLE CURVE, MAY OFTEN BE USED WITH GOOD EFFECT.

D. MAY SOMETIMES BE USED FOR LONG WALKS, BUT USELESS AND UNDESIRABLE FOR SHORT DISTANCES.

E. MEANINGLESS CURVE, SHOULD BE AVOIDED. E', E" NOT AS BAD AS E, BECAUSE OF LARGER CURVE, BUT NOT DESIRABLE EXCEPT FOR PLEASURE PATHS.

F. ISLANDS ARE ALWAYS ANNOYING AND WASTEFUL OF TIME AND ENERGY.

G. SMALL TRIANGLES SHOULD USUALLY BE AVOIDED. G' IS BETTER THAN G.

H. USED FOR DRIVES OF LARGE RADIUS AND WITH LOW PLANTING.

DIVISIONS OF CURVED WALKS AND DRIVES SHOULD BE TANGENT TO LINES OF MAIN CURVE (J AND K) AND BRANCHES SHOULD BE TAKEN FROM OUTSIDE OF CURVE (H AND K) RATHER THAN FROM INSIDE (J). HOWEVER, PRIVATE ROADS FROM MAIN ROADS SHOULD ENTER GROUNDS AT RIGHT ANGLES TO MAIN ROAD (M) INSTEAD OF AN ACUTE ANGLE (N). L IS TOO NEAR MAIN CROSS ROADS BUT IS LESS DANGEROUS THAN DIRECTLY FROM ANGLE OF MAIN ROAD, O. [BAILEY AND OTHERS]

CONSTRUCTION OF WALKS AND ROADS.

CROWN 1" TO 1'-0"
3"
IMPROVED BY WORKING IN SAND OR CLAY TO A DEPTH OF 3" OR 4".
TURF WALK AND SAND-CLAY WALK.
6'-0"
4"
MIN. CROWN 1/2 TO 1'-0"
3"
2"
1/2" TO 1 1/2" STONE OR GRAVEL
3"
3"-6" SUB-BASE IF NEEDED FOR DRAINAGE
SMOOTH OFF WITH STONE DUST OR SAND OR FINISH WITH 1" OF SAND AND ASPHALT.
MACADAM AND GRAVEL WALK.
1" TOP
MIN. CROWN 1/4" TO 1'-0"
1"
3" BASE
3"-6" SUB-BASE IF NEEDED FOR DRAINAGE
TOP:- 1 PART CEMENT 1 1/2 PARTS SAND.
BASE:- 1:3:5 CONCRETE.
CEMENT WALK
1"-2" TOP OF SCREENED CINDERS AND CLAY
3"-4" COARSE CINDERS
CINDER-CLAY SURFACE.

FOR RUNNING TRACKS, TENNIS COURTS AND UNDER PLAYGROUND APPARATUS ALSO FOR WALKS WITH 1/2" CROWN TO 1'-0". PROPORTIONS OF CINDERS AND CLAY WILL VARY FROM EQUAL PARTS TO 1:2 CINDERS AND CLAY.

WHATEVER THE CONSTRUCTION OF WALKS AND ROADS, THE SUB-GRADE SHOULD BE WELL COMPACTED, OF UNIFORM GRADE AND CROSS SECTION, AND SHOULD HAVE GOOD DRAINAGE.

THE SUB-BASE SHOULD BE OF COARSE MATERIALS, WELL COMPACTED. THE TOP SHOULD BE CROWNED, THE AMOUNT DEPENDING UPON THE MATERIAL AND LONGITUDINAL GRADE.

WALKS AND DRIVES ARE EXPENSIVE AND DETRACT FROM THE APPEARANCE OF THE GROUNDS, HENCE SHOULD BE NO WIDER THAN NECESSARY. A WIDTH OF ABOUT 18" WILL BE REQUIRED FOR EACH PERSON. A WIDTH OF 4'-6" OR 5'-0" WILL ALLOW TWO PERSONS TO PASS TWO PERSONS, ALTHO WITH SOME INCONVENIENCE. FOR FOUR PERSONS TO WALK ABREAST A WIDTH OF 6'-0" WILL BE REQUIRED FOR ADULTS.

ROADS FOR SINGLE VEHICLES SHOULD BE AT LEAST 7'-0" WIDE (BETTER 8'); AND FOR TWO VEHICLES, 13' OR 14'.

FOR ROAD CONSTRUCTION, SEE PUBLICATIONS U.S. DEPT. OF AGRICULTURE. ADDRESS SUPT. OF DOCUMENTS, GOVT. PRINTING OFFICE, WASHINGTON, D.C.

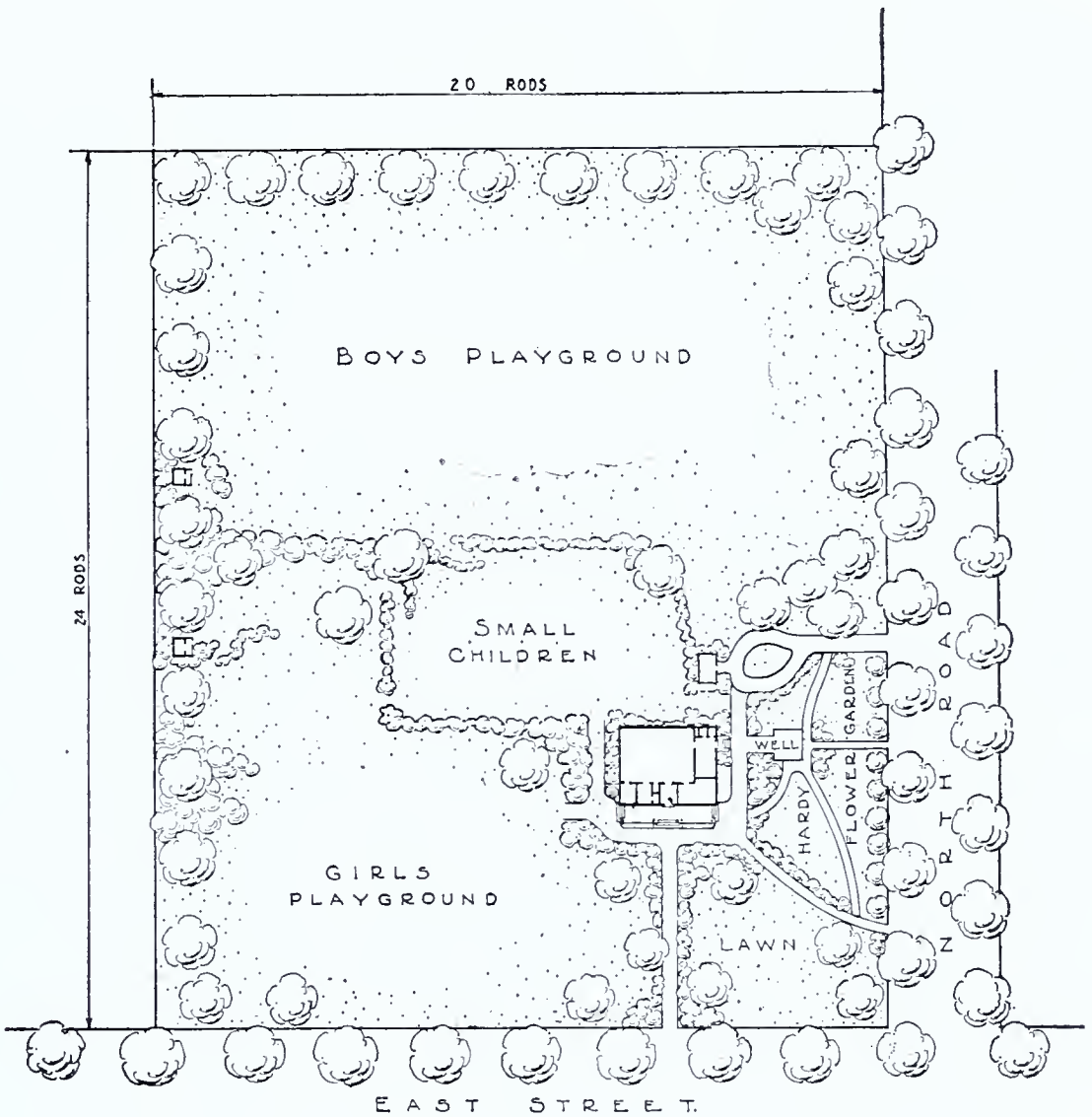
FARMERS BULLETIN, 338 - MACADAM ROADS, (5¢)

DEPT. OF AG'R. BULLETINS:-

463. EARTH, SAND-CLAY AND GRAVEL ROADS. (15¢)

249 PORTLAND CEMENT CONCRETE PAVEMENTS FOR COUNTRY ROADS. (15¢)

E.C.E.



E. C. Earl arch't

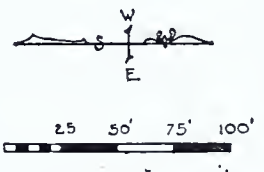
PLAN A — 3 ACRES

SCHOOLHOUSE #2 PLATE X

THIS AND THE FOLLOWING PLANS OF SCHOOL GROUNDS MAY SEEM TOO ELABORATE FOR COUNTRY SCHOOLS. THE WALKS SHOW LINES OF GREATEST TRAVEL. SOME WILL ALWAYS REMAIN EARTH PATHS BUT IN MOST CASES THEY SHOULD BE OF PERMANENT CONSTRUCTION. HOWEVER A PART ONLY MAY BE BUILT EACH YEAR UNTIL COMPLETED.

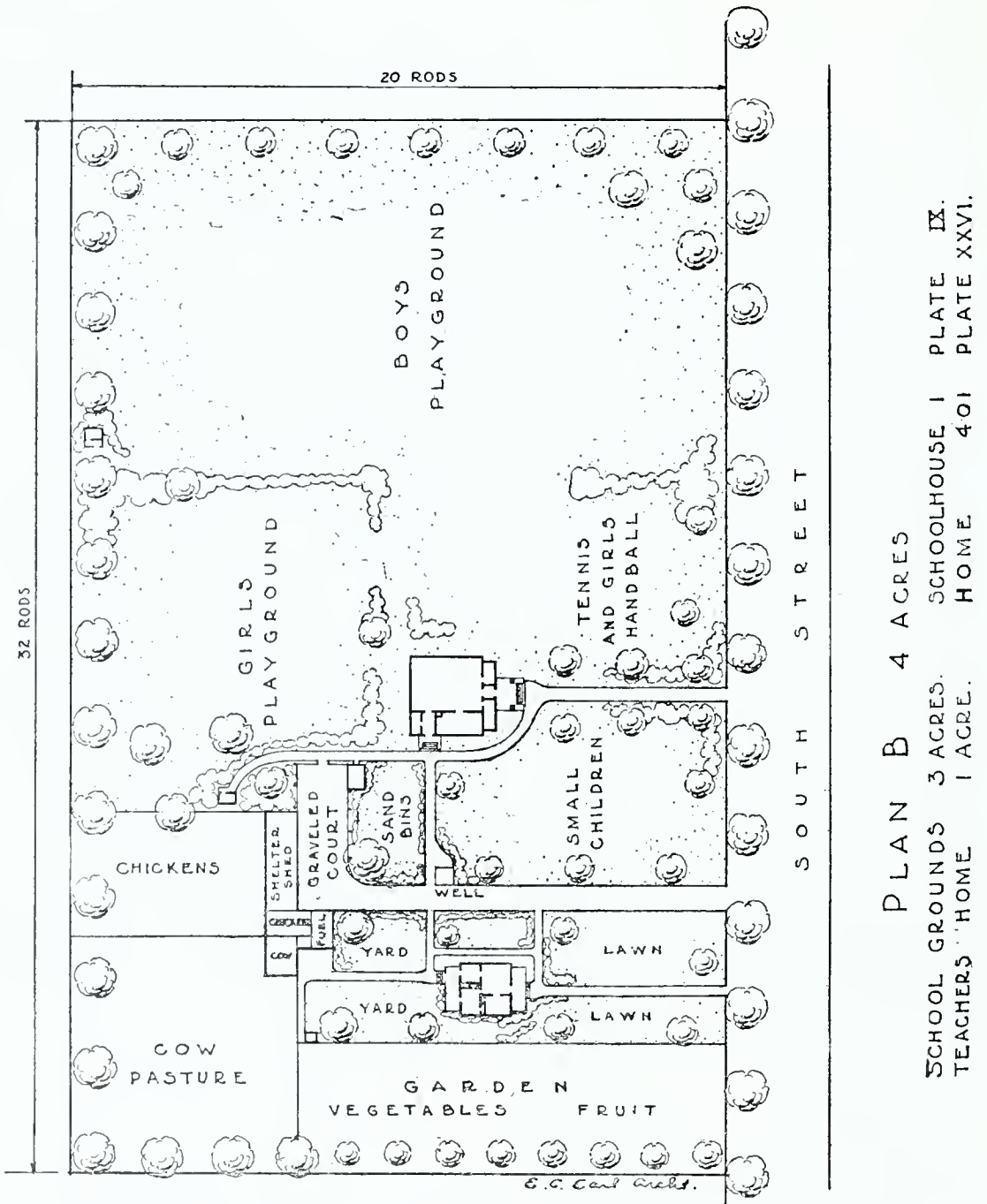
A GOOD PLAN SHOULD BE STUDIED OUT TO MEET THE PARTICULAR REQUIREMENTS OF EACH SITE AND THE PERMANENT PLANTING MADE TO CONFORM TO THIS DESIGN EVEN THO EXTENDED OVER SEVERAL YEARS.

MUCH THOUGHT MAY PROFITABLY BE GIVEN TO THE SCHOOL GROUNDS BY TEACHERS AND ALL INTERESTED IN THE SCHOOL. THE LAYING OUT OF SCHOOL AND HOME GROUNDS AND THE MAKING OF PLANTING LISTS WOULD BE A FASCINATING SCHOOL EXERCISE.



SCALE: 1" = 100'

SCHOOL GROUNDS PLAN A	THE SCHOOLHOUSE	PLATE III



PLAN B 4 ACRES

SCHOOL GROUNDS 3 ACRES. SCHOOLHOUSE I PLATE IX.
TEACHERS' HOME 1 ACRE. HOME 401 PLATE XXVI.

CONSULT PUBLICATIONS UNITED STATES DEPARTMENT OF AGRICULTURE
GOVERNMENT PRINTING OFFICE WASHINGTON, D. C.

FARMERS BULLETINS	185	BEAUTIFYING THE HOME GROUNDS
	218	SCHOOL GARDEN
	494	LAWN SOILS AND LAWNS
EACH 5¢	750	ROSES FOR THE HOME
		BEAUTIFYING THE FARMSTEAD BY F.L. MULFORD

25 50 75 100

SCALE 1"=100'

SCHOOL GROUNDS PLAN B

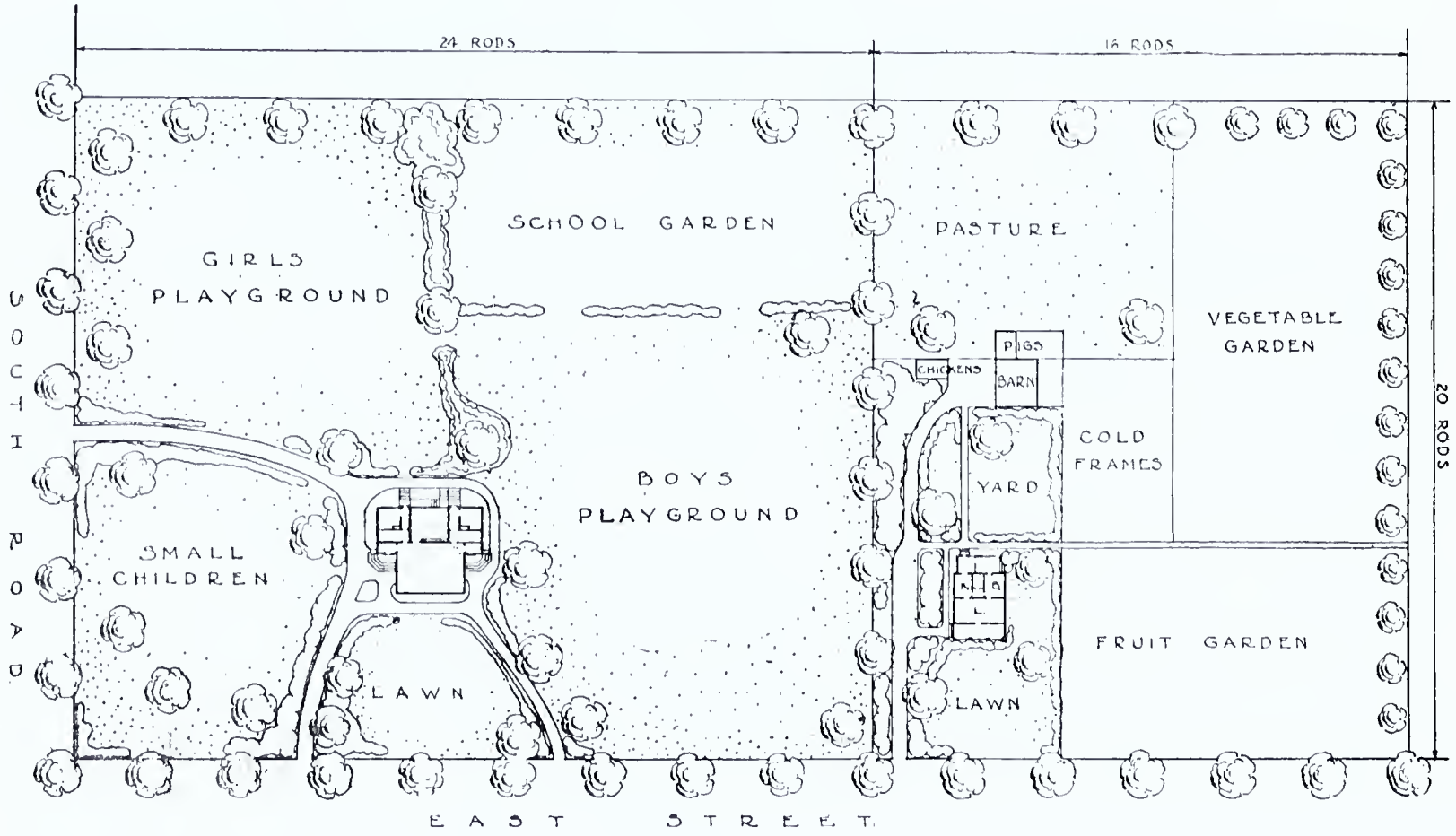
THE SCHOOLHOUSE

PLATE IV

SCHOOL GROUNDS
PLAN C

THE SCHOOLHOUSE.

PLATE V.



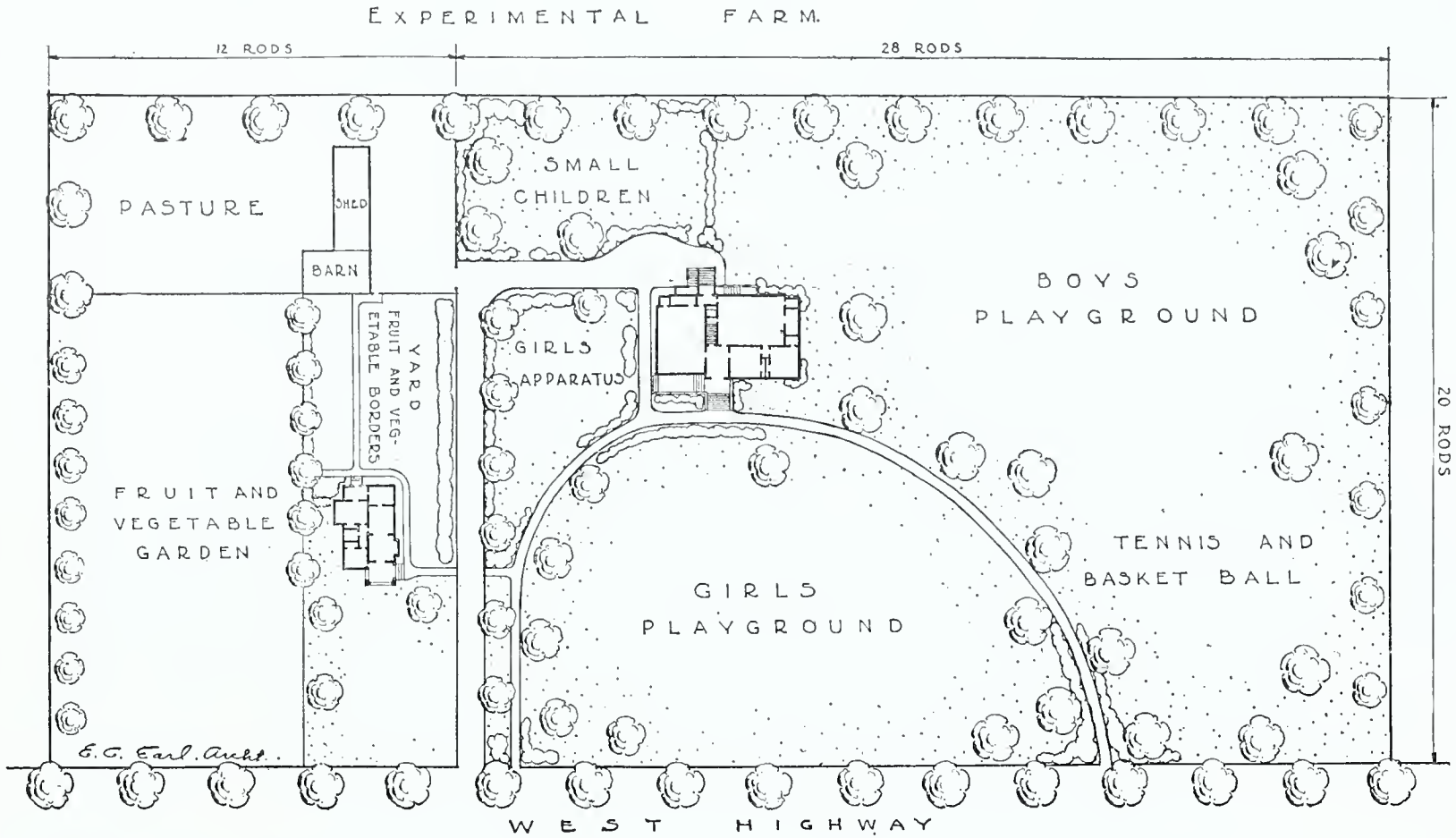
PLAN C 5 ACRES.

SCHOOL GROUNDS 3 ACRES ~ SCHOOLHOUSE 3 PLATE XI.
TEACHERS HOME 2 ACRES ~ HOME 301 PLATE XXVII.

SCHOOL GROUNDS
PLAN D

THE SCHOOLHOUSE

PLATE XI



SCALE 1" = 100'

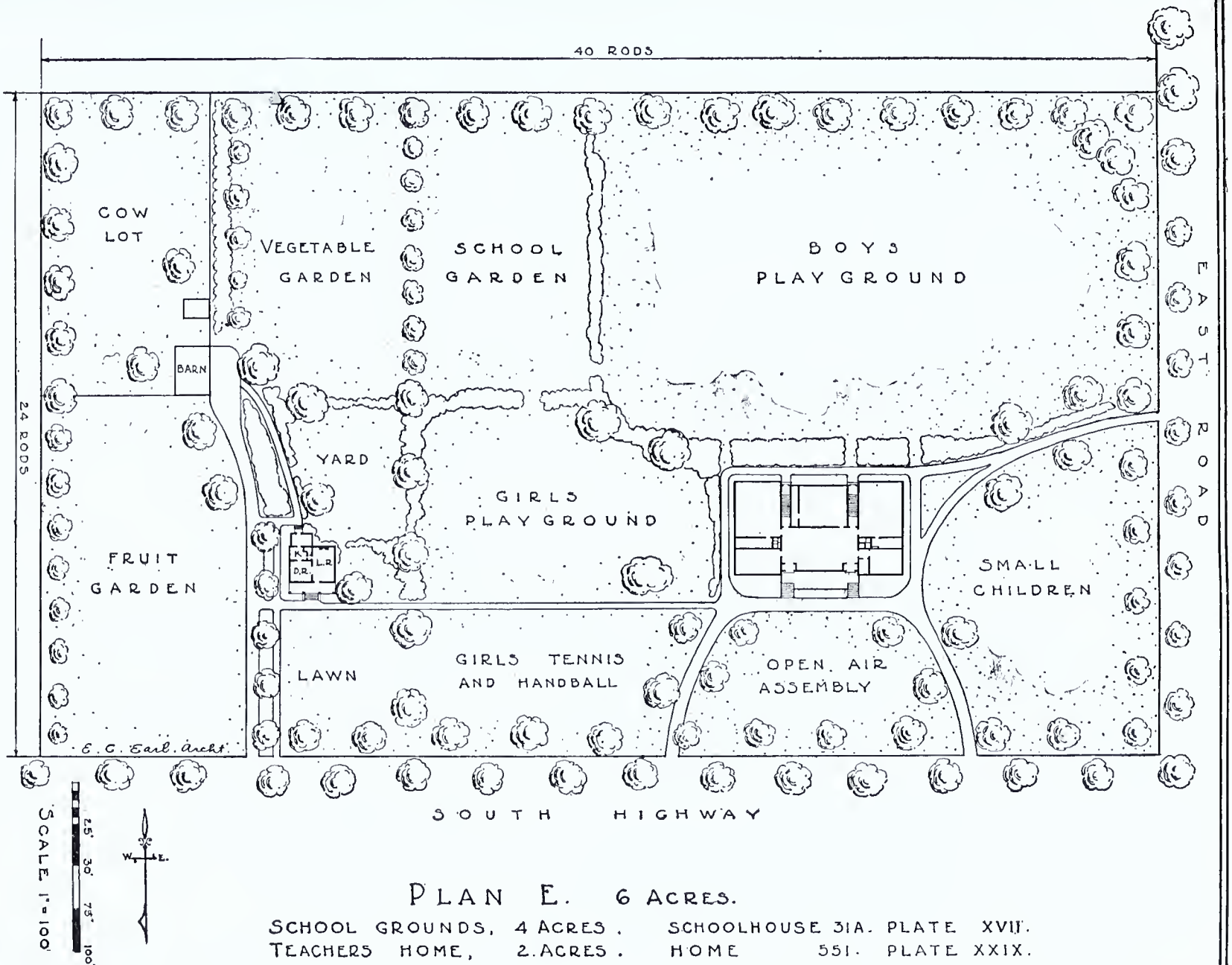
PLAN D 5 ACRES.

SCHOOL GROUNDS 3½ ACRES — SCHOOLHOUSE 22 PLATE XV.
TEACHERS HOME 1½ ACRES — HOME 501 PLATE XXVIII.

SCHOOL GROUNDS
PLAN E

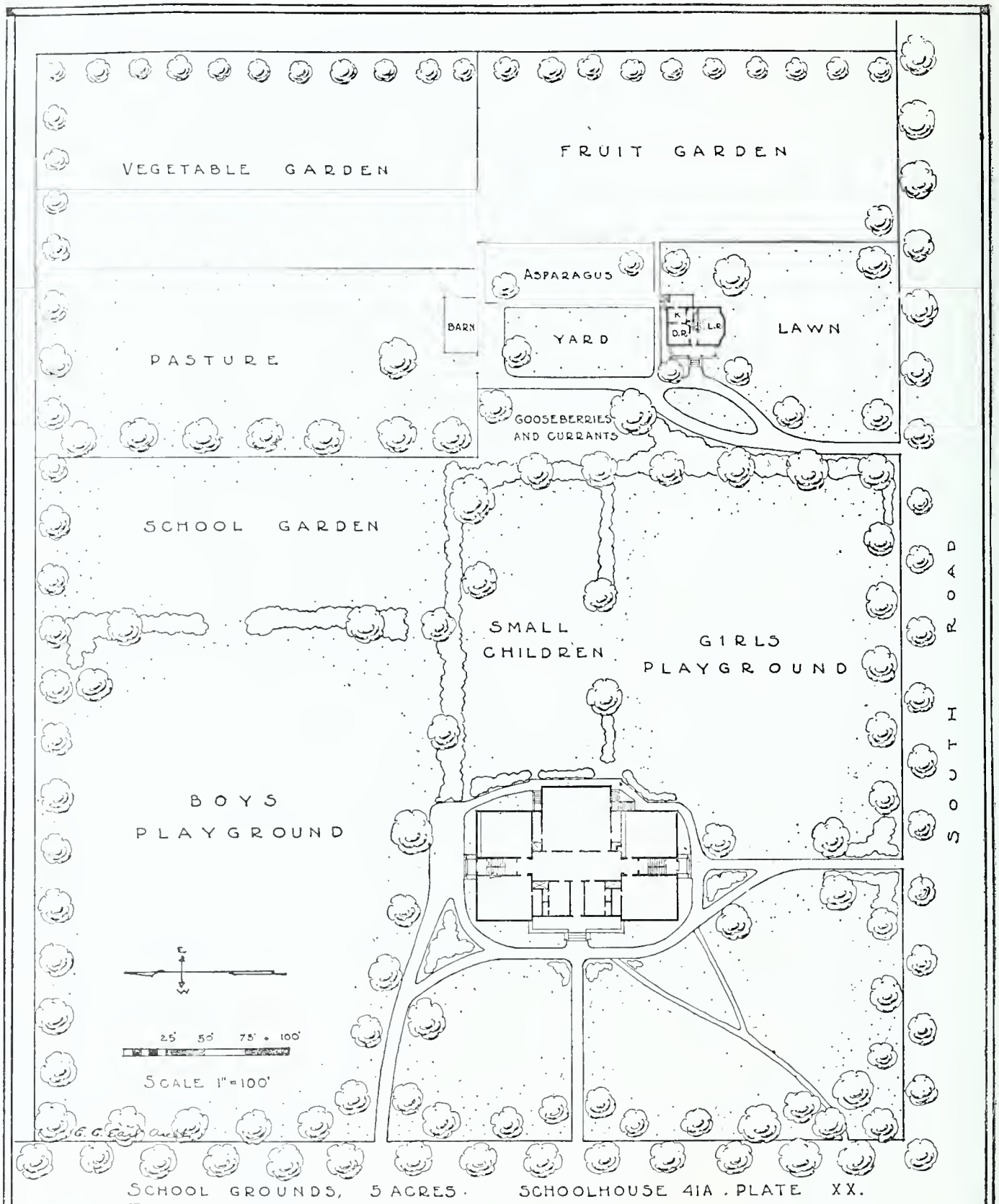
THE SCHOOLHOUSE

PLATE VII



PLAN E. 6 ACRES.

SCHOOL GROUNDS, 4 ACRES. SCHOOLHOUSE 31A. PLATE XVII.
TEACHERS HOME, 2. ACRES. HOME 551. PLATE XXIX.

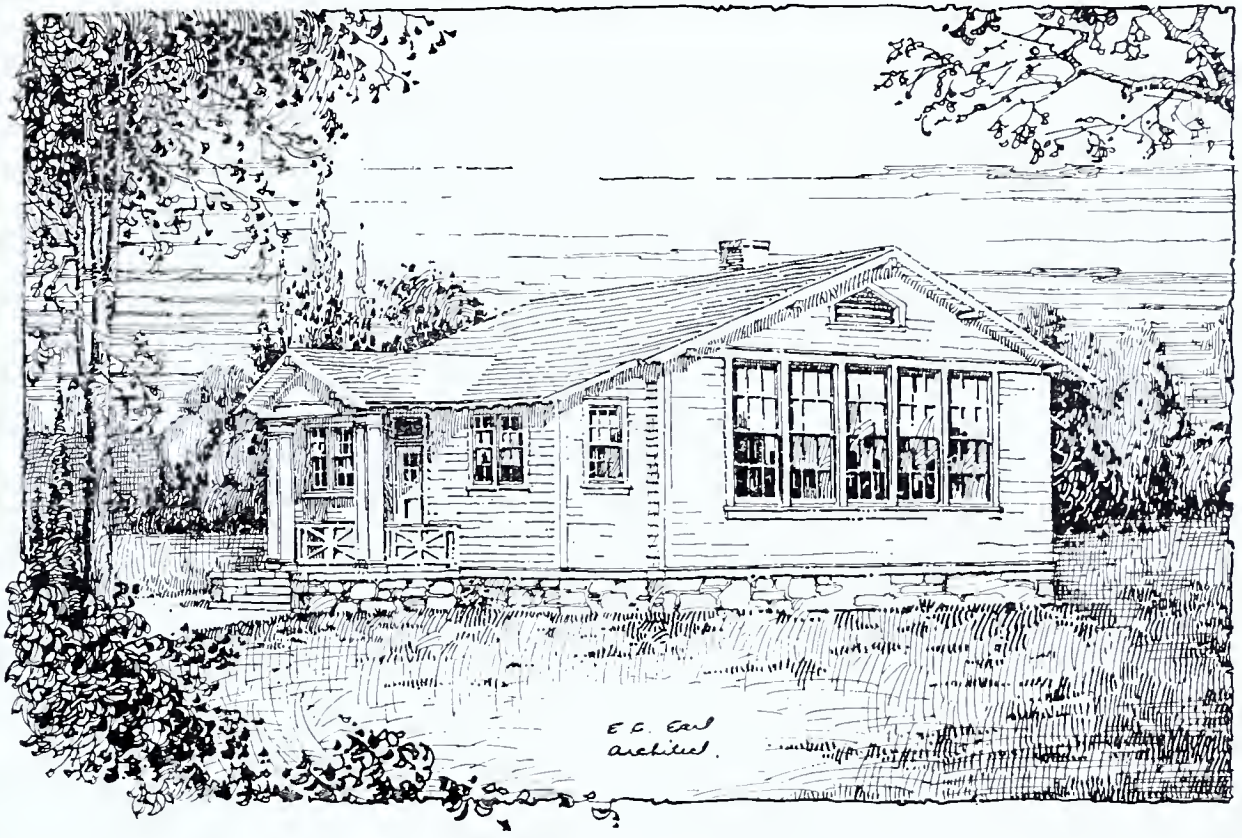


SCHOOL GROUNDS, 5 ACRES. SCHOOLHOUSE 41A. PLATE XX.
TEACHERS HOME, 3 ACRES. HOME 651. PLATE XXX.

SCHOOLGROUNDS PLAN F

THE SCHOOLHOUSE.

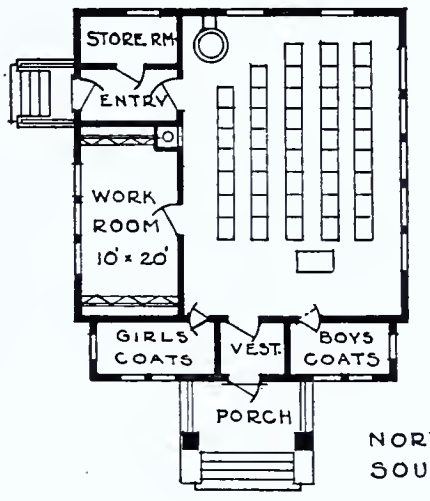
PLATE VIII.



A One Room School Building.

This is a good homelike building planned for modern school work. The lighting is from one side. The high windows in the rear being used for ventilation. Heating is by jacketed stove with connection to outside air and with large ventilating flue. The work room is large enough for use by both boys and girls

The walls are of siding over building paper and sheathing The roof is covered with wood or slate surfaced asphalt shingles.



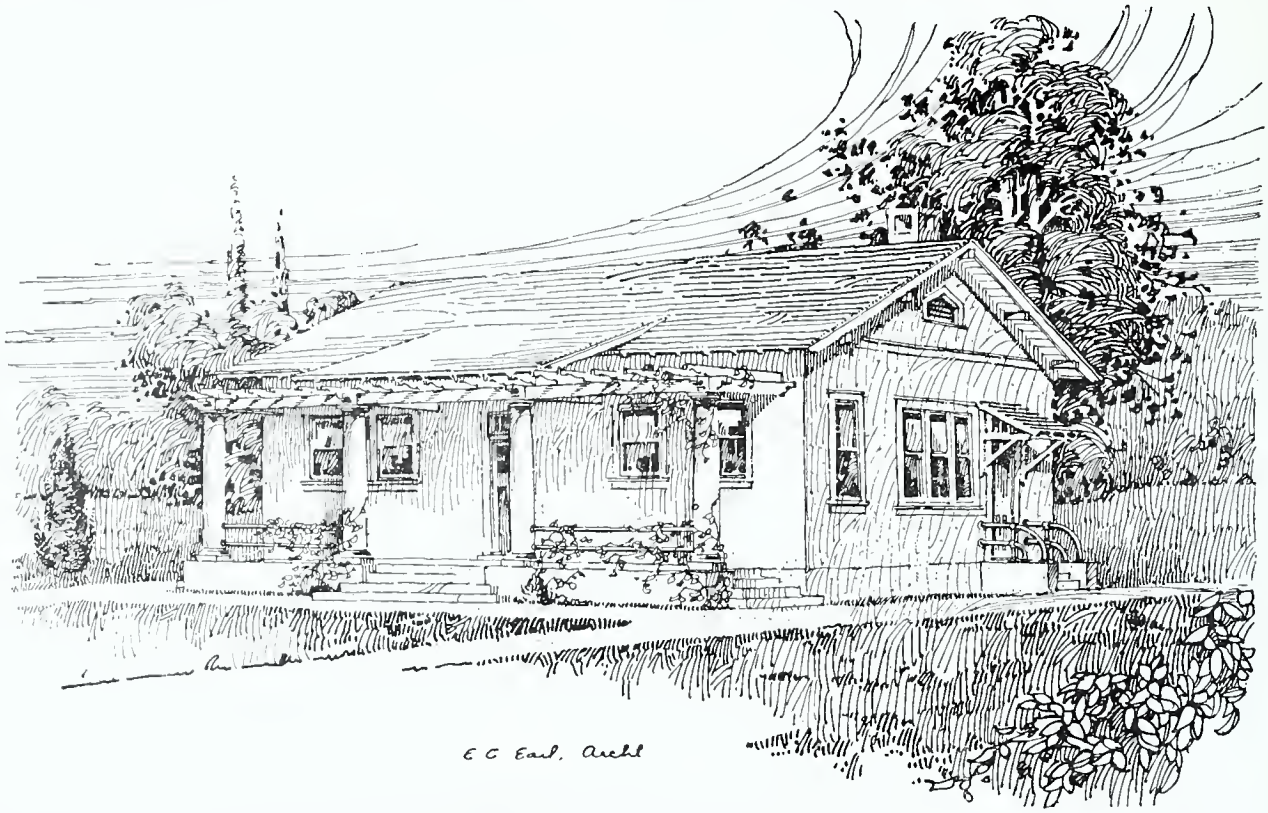
NORTH OR SOUTH FRONT.

PLAN

5' 10' 20' 30'

SCALE.

SCHOOL DESIGN I.	THE SCHOOLHOUSE.	PLATE IX.

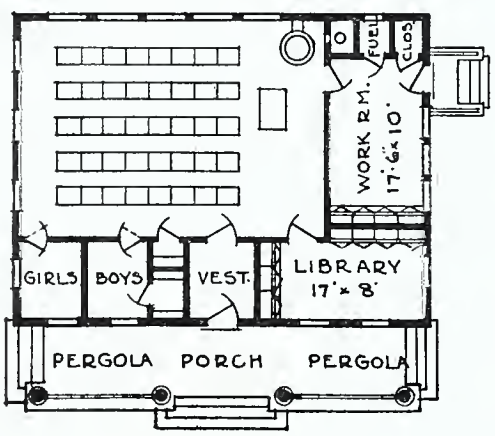


A One Room School Building.

Or, to be exact, a three room, one teacher building. The library is large enough for an office and a study room for the older pupils or it could be used as a public library and club room saturdays and evenings. If to be used by the public it should be 10 or 12 ft. wide.

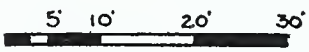
There are 40 desks shown in a room 23 × 31 ft. Educators agree that one teacher should not have charge of 40 pupils. But it does occur; the attendance may not be 100% of enrollment and some pupils will use the library and work room without constant supervision. There is abundant storage space for books, supplies and equipment.

The construction is frame. Stucco finish is shown in the design altho bevel siding or shingles may, of course, be used. The foundtions should be stone or concrete.



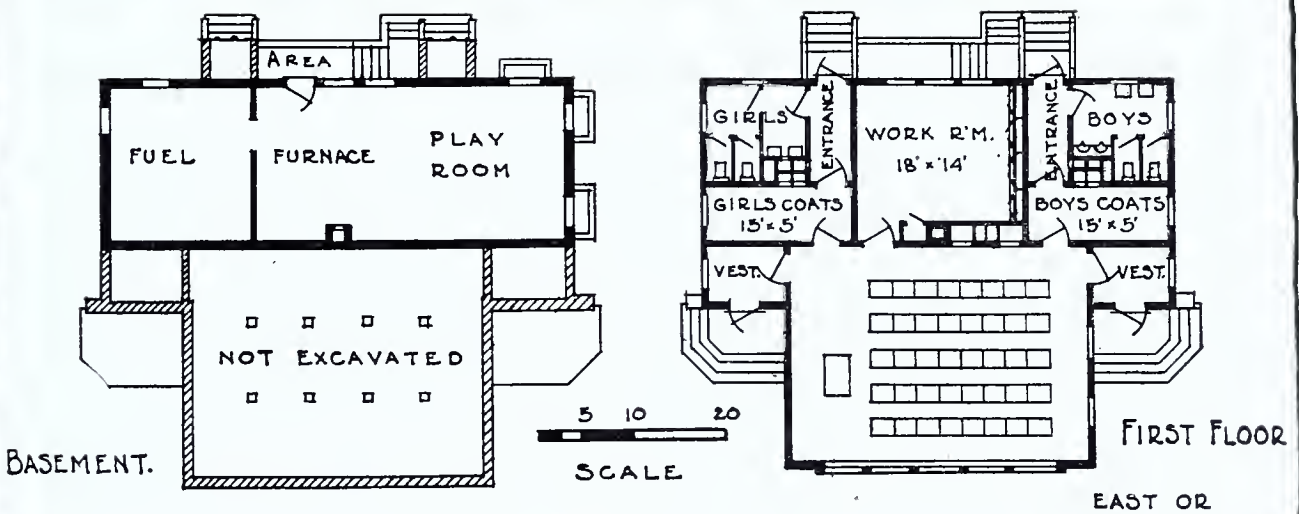
East or West Front.

Plan



Scale

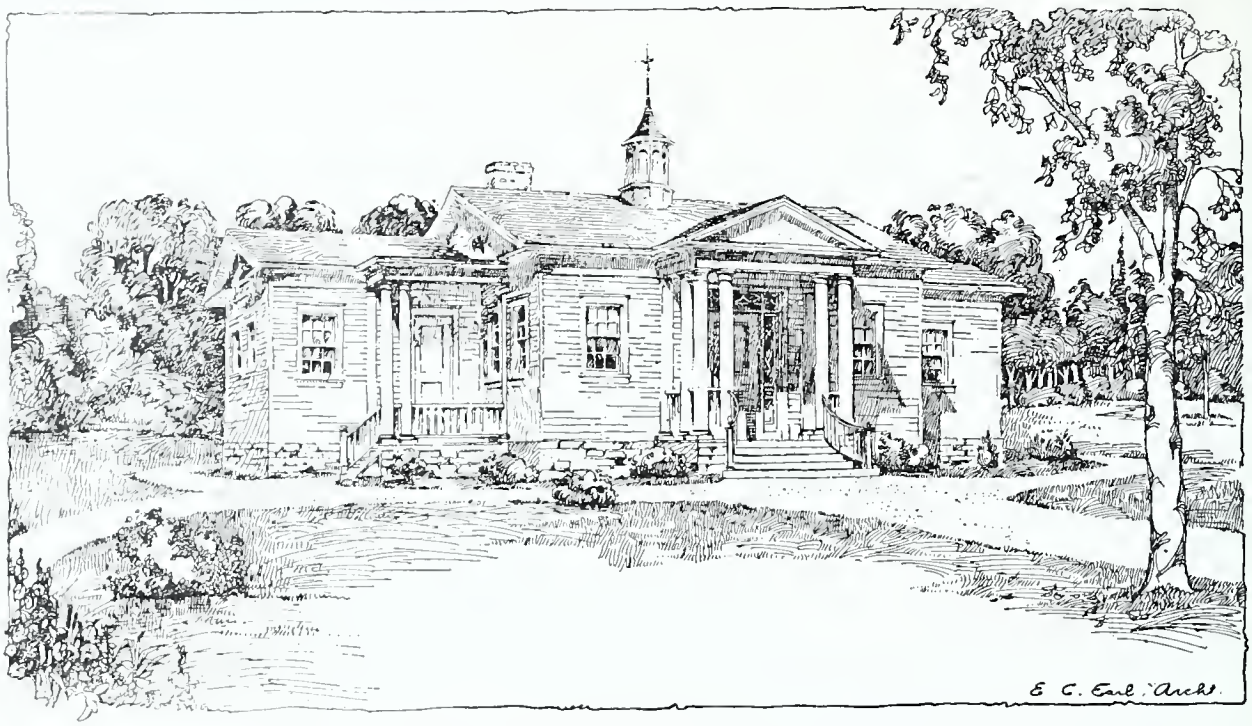
School Design 2	The Schoolh'ouse	Plate X



A One Room School Building

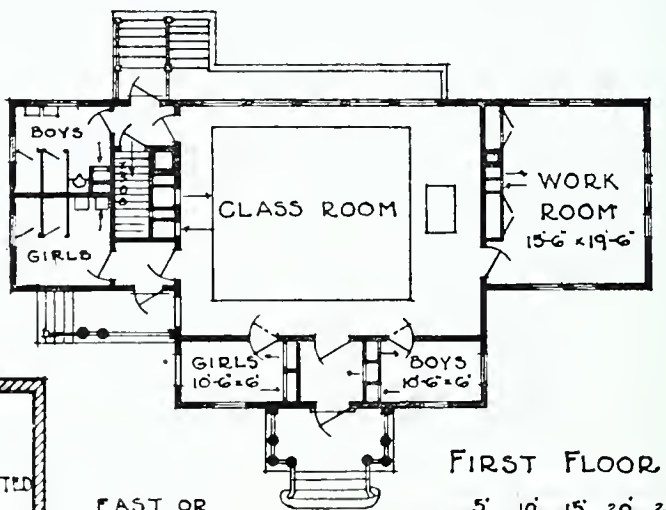
All of the equipment is on the first floor except heating plant, pump, pressure tank, etc. The furnace room is 33 × 17 ft. and may be used also for a play room. A smaller basement would do for heating plant only. Or the toilets with baths might be placed in the basement, thus providing rooms 15 × 15 ft. for manual training and domestic science on first floor: the workroom being used as a club room and library. The building is frame; finish, stucco; foundation, stone or concrete.

School Design 3.	The Schoolhouse.	Plate XI.



A ONE ROOM SCHOOLHOUSE

THIS PLAN SHOWS HOW A WORK ROOM AND TOILET ROOMS MAY BE ADDED TO EXISTING COUNTRY SCHOOL BUILDINGS. AN ALTERNATIVE PLAN IS TO PLACE THE TOILETS IN THE BASEMENT AND USE THE SPACE ON FIRST FLOOR FOR A SCHOOL OR PUBLIC LIBRARY AND BOYS CLUB ROOM.

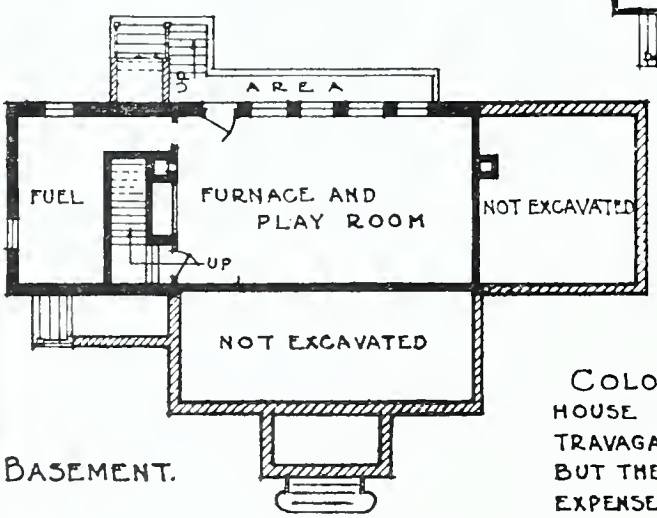


FIRST FLOOR

EAST OR WEST FRONT

5' 10' 15' 20' 25'

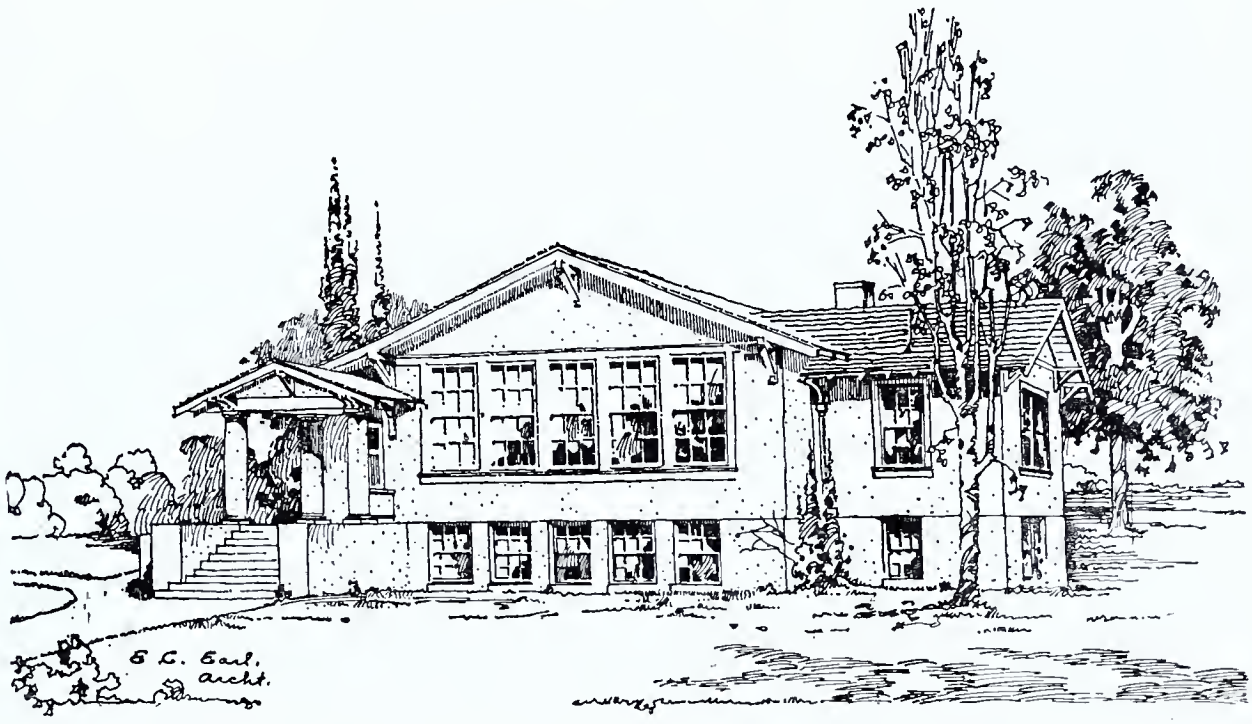
SCALE

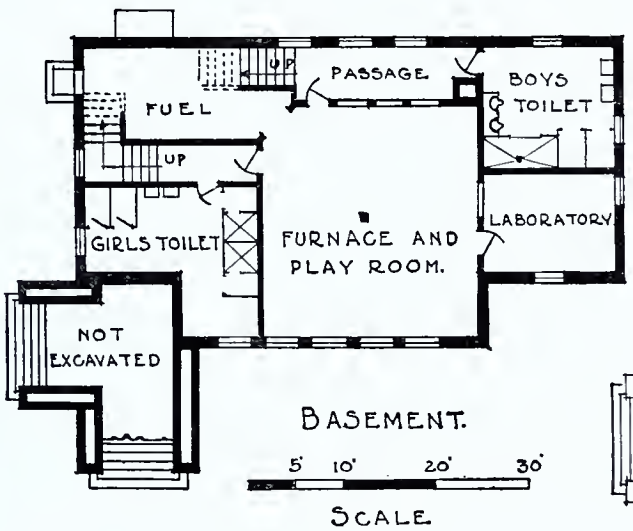


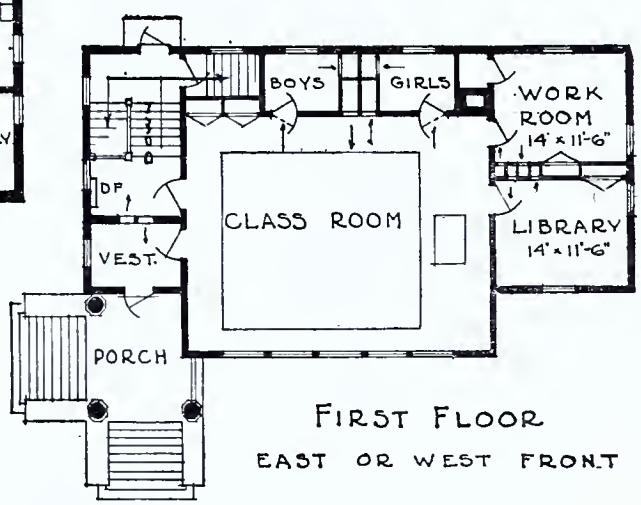
BASEMENT.

COLONIAL WORK IS WELL ADAPTED TO SCHOOL HOUSE DESIGN. THE PORCHES MAY SEEM EXTRAVAGANT FOR A ONE ROOM SCHOOL BUILDING BUT THE COST IS NOT GREAT AND THE LITTLE EXTRA EXPENSE WILL PROVE TO BE A GOOD INVESTMENT.

SCHOOL DESIGN 4	THE SCHOOLHOUSE.	PLATE XII



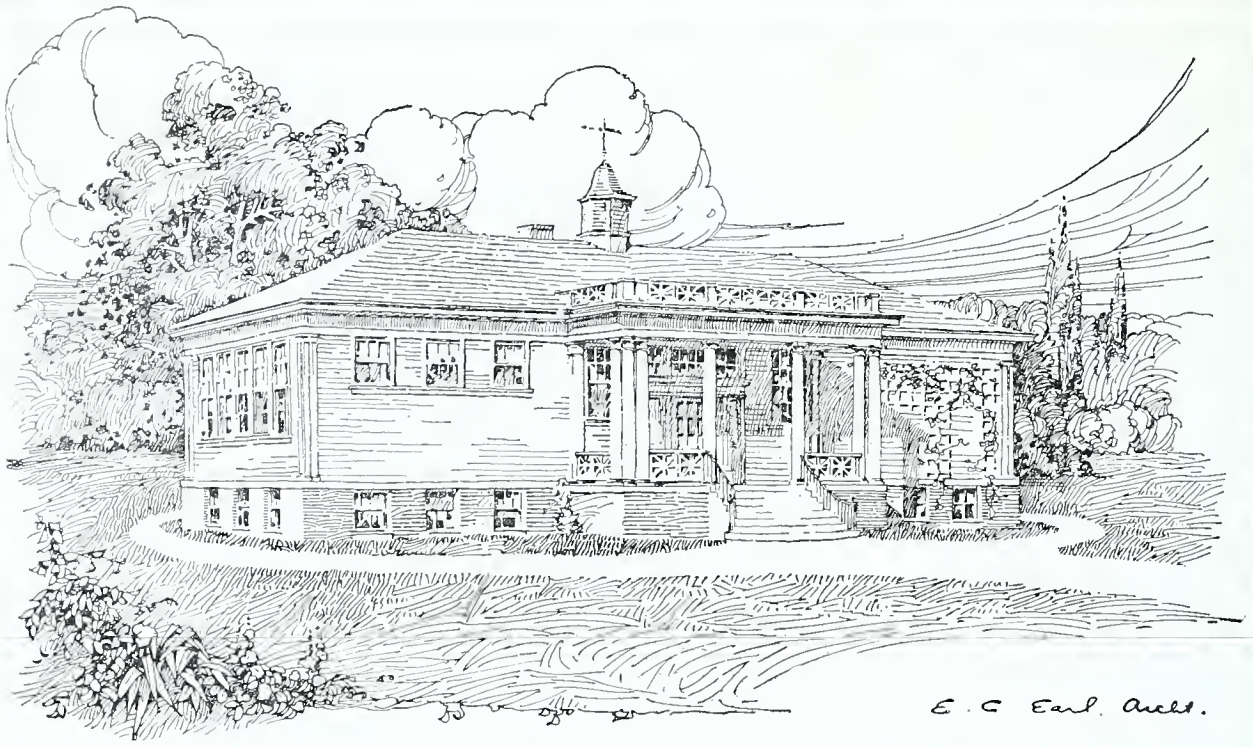




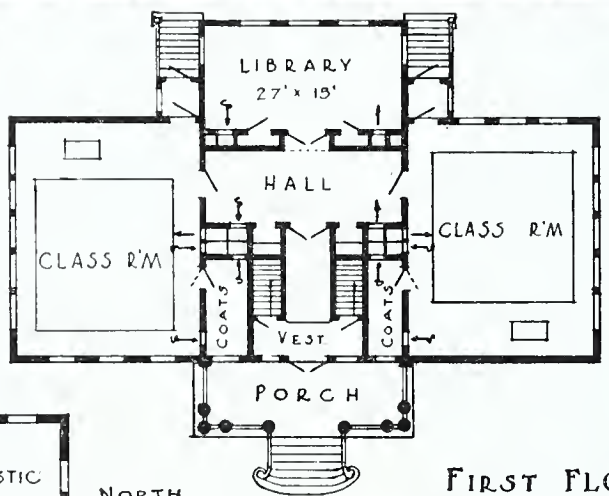
A One Room Schoolhouse

With nearly everything the educators ask for. The lighting is unilateral with possible ventilation from all sides. The basement is high and well lighted. The play space could be used for manual training. As shown it is a play room and shelter for early comers. The exterior treatment may be varied from the stucco finish indicated. Bevel siding with shingled gables and foundations of field stone would look quite as well

SCHOOL DESIGN 5.	THE SCHOOLHOUSE.	PLATE XIII.



A TWO ROOM SCHOOLHOUSE WITH LARGE LIBRARY AND CLUB ROOM ON FIRST FLOOR. MANUAL TRAINING, DOMESTIC SCIENCE AND TOILET ROOMS ARE IN THE BASEMENT. THE TWO REAR VESTIBULES COULD BE OMITTED IN THE SOUTH OR IF BUILDING FRONTS NORTH. THE BASEMENT IS OF BRICK WITH BEVEL SIDING ABOVE

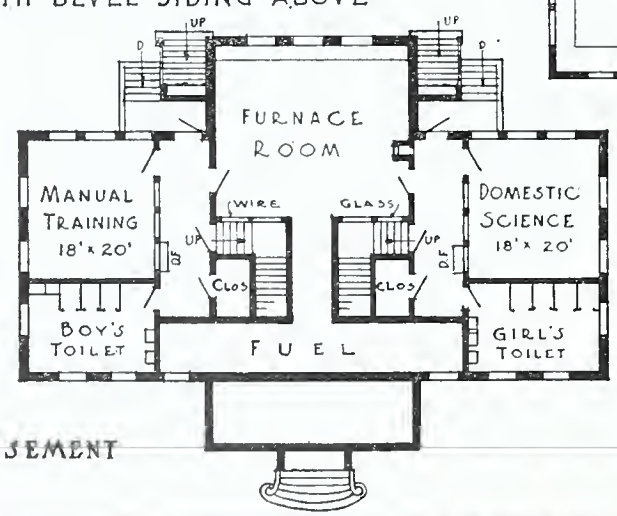


FIRST FLOOR

NORTH OR SOUTH FRONT.

0 5 10 20 30

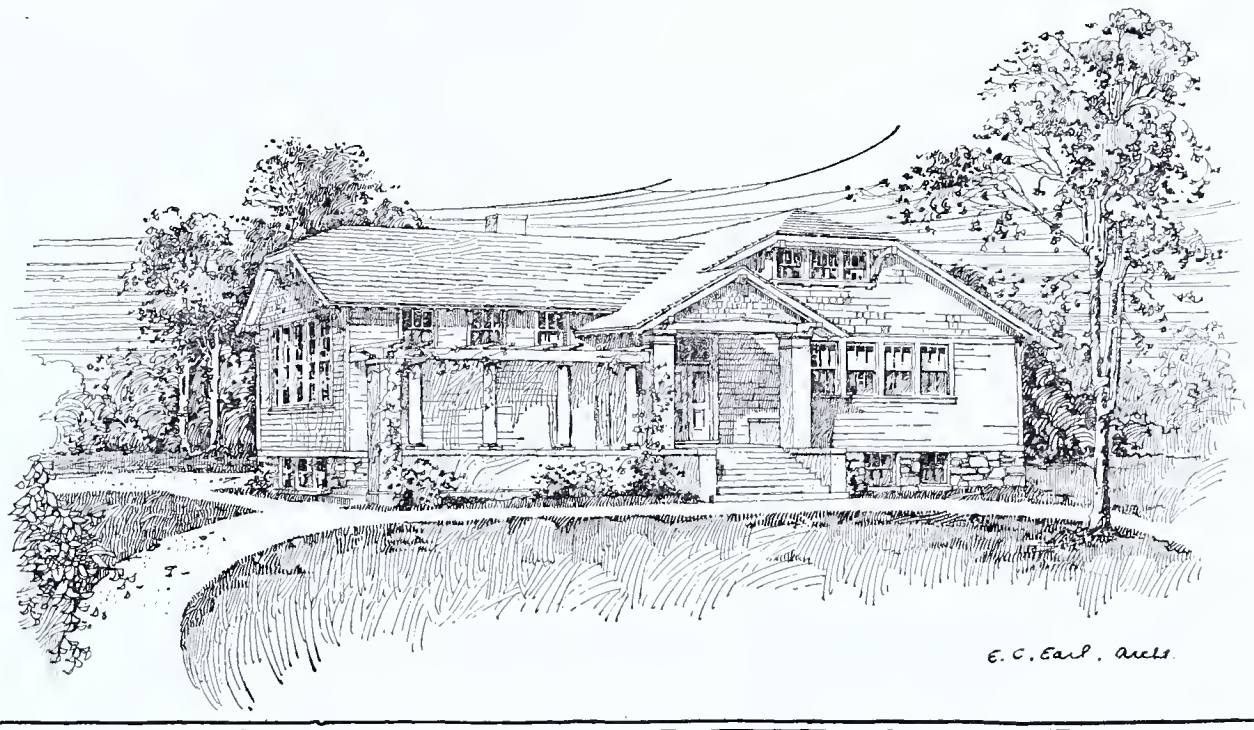
SCALE

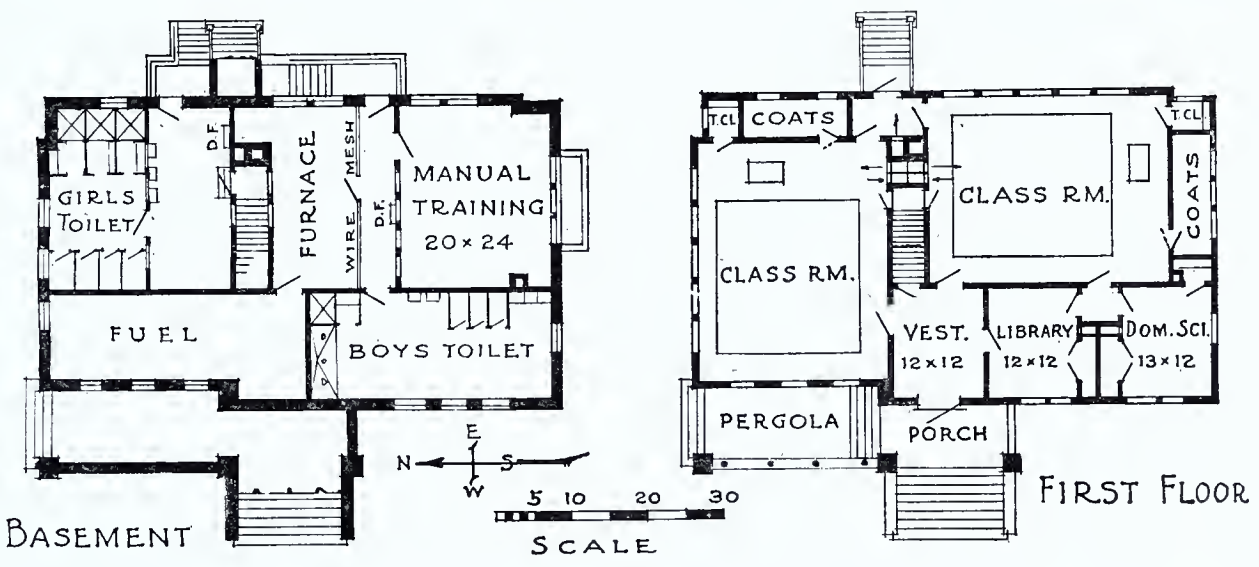


BASEMENT

THERE IS LITTLE WASTE SPACE AND NO CROWDING. THE STAIRS TO BASEMENT ARE 4'-0" WIDE. COLONIAL WORK IS NEARLY ALWAYS DIGNIFIED AND PLEASING.

SCHOOL DESIGN 21	THE SCHOOLHOUSE.	PLATE XIV

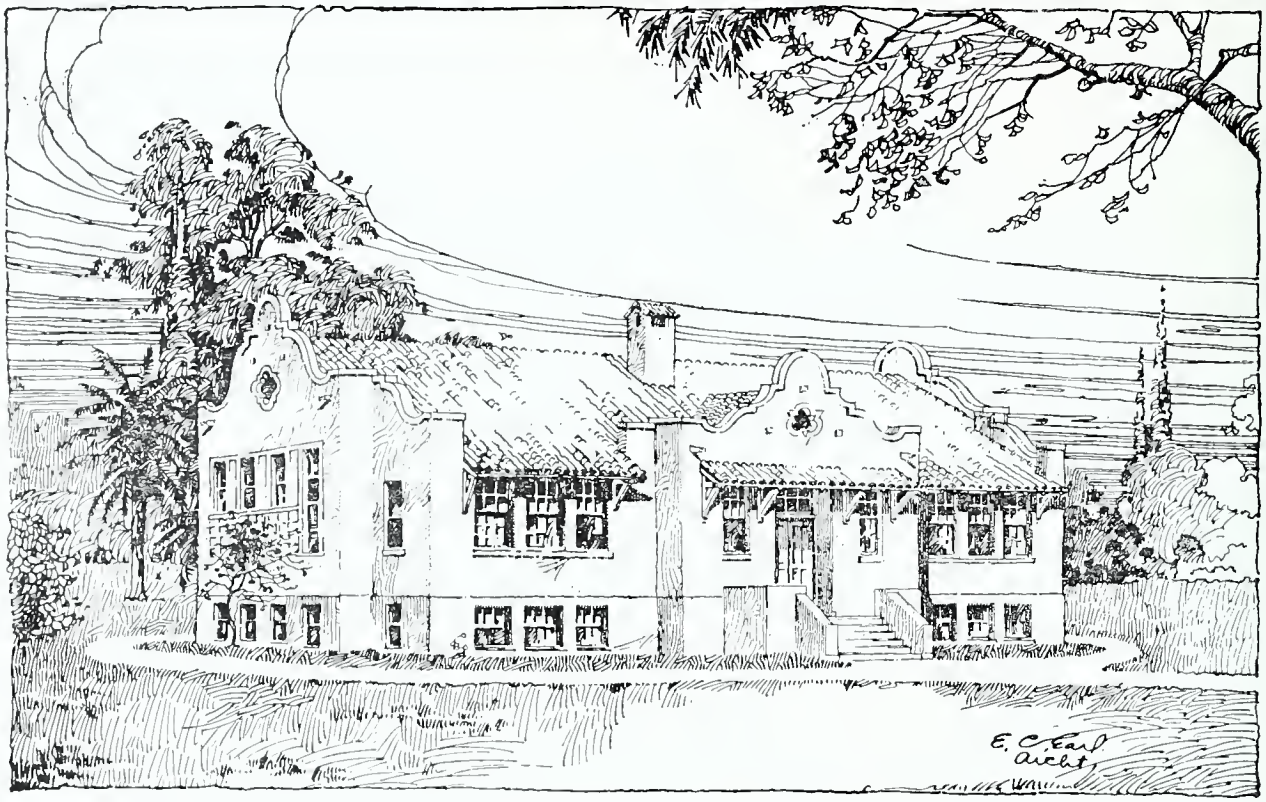


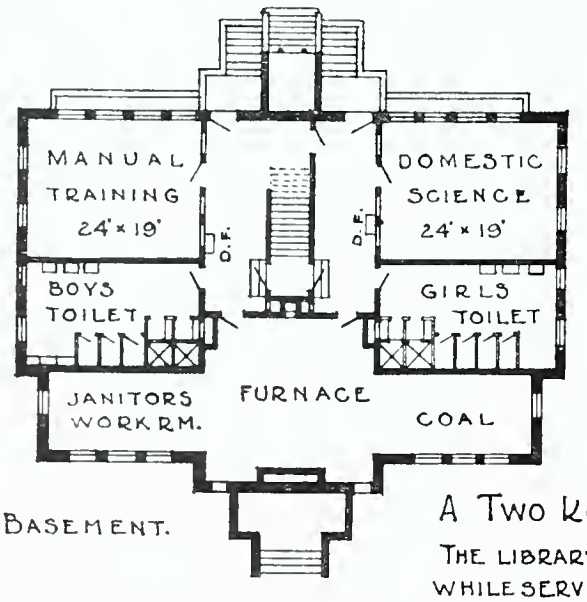


A TWO ROOM SCHOOLHOUSE

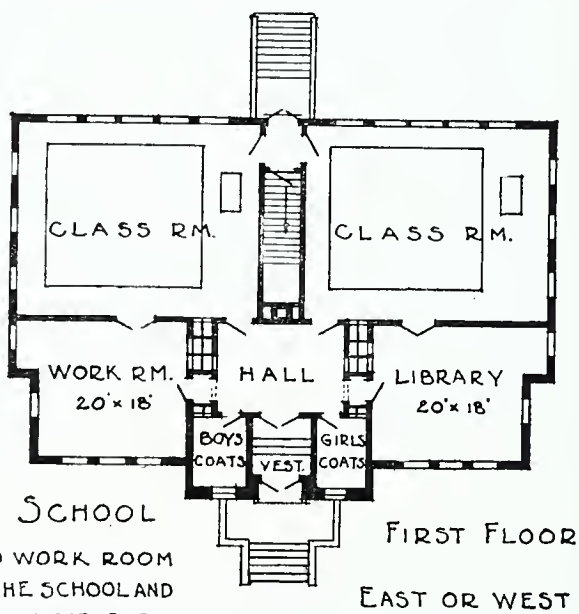
LIBRARY AND DOMESTIC SCIENCE ROOM ON FIRST FLOOR.
MANUAL TRAINING AND TOILET ROOMS IN BASEMENT.
PLAY ROOM OR STORE ROOM IN ATTIC.
THE PORCH AND PERGOLA WITH VINES AND SHRUBBERY GIVE THE BUILDING AN INVITING HOMELIKE APPEARANCE.

SCHOOL DESIGN 22	THE SCHOOLHOUSE	PLATE XV





BASEMENT.



FIRST FLOOR

A TWO ROOM SCHOOL

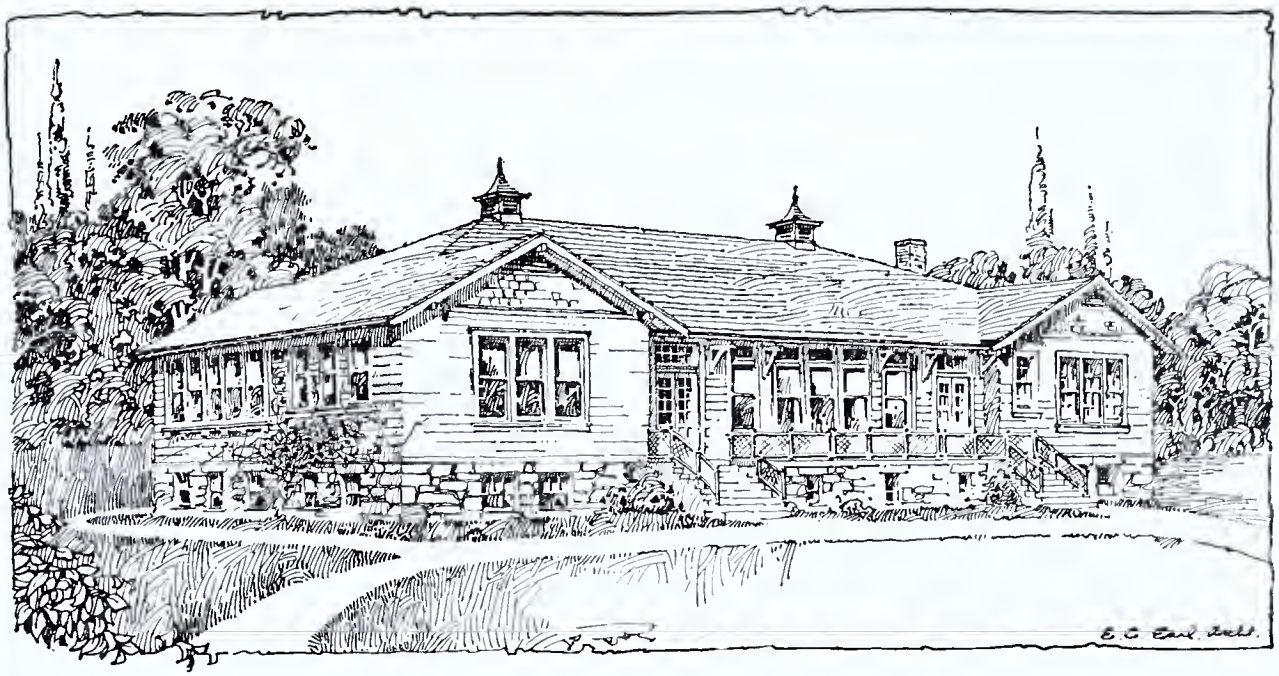
THE LIBRARY AND WORK ROOM WHILE SERVING THE SCHOOL AND EASILY OVERSEEN BY THE TEACHERS MAY ALSO BE USED BY THE PUBLIC WITHOUT INTERFERING WITH THE WORK OF THE CLASS ROOMS. SEPARATE COAT ROOMS ARE PROVIDED FOR BOYS AND GIRLS. THE BOYS ARE SUPPOSED TO USE THE OUTSIDE STEPS TO BASEMENT.

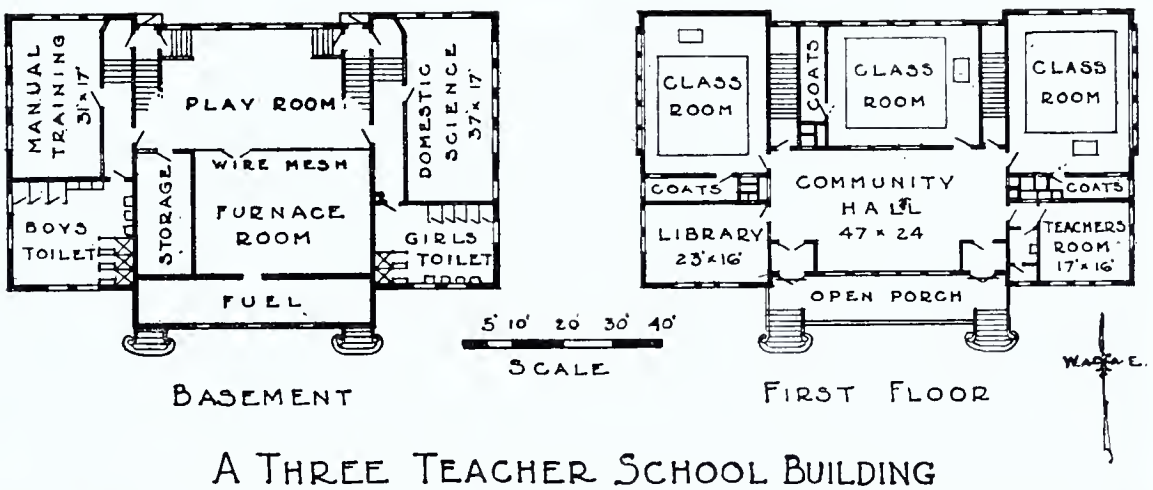
EAST OR WEST FRONT

5' 10' 20 30'

SCALE

SCHOOL DESIGN 23	THE SCHOOLHOUSE	PLATE XVI

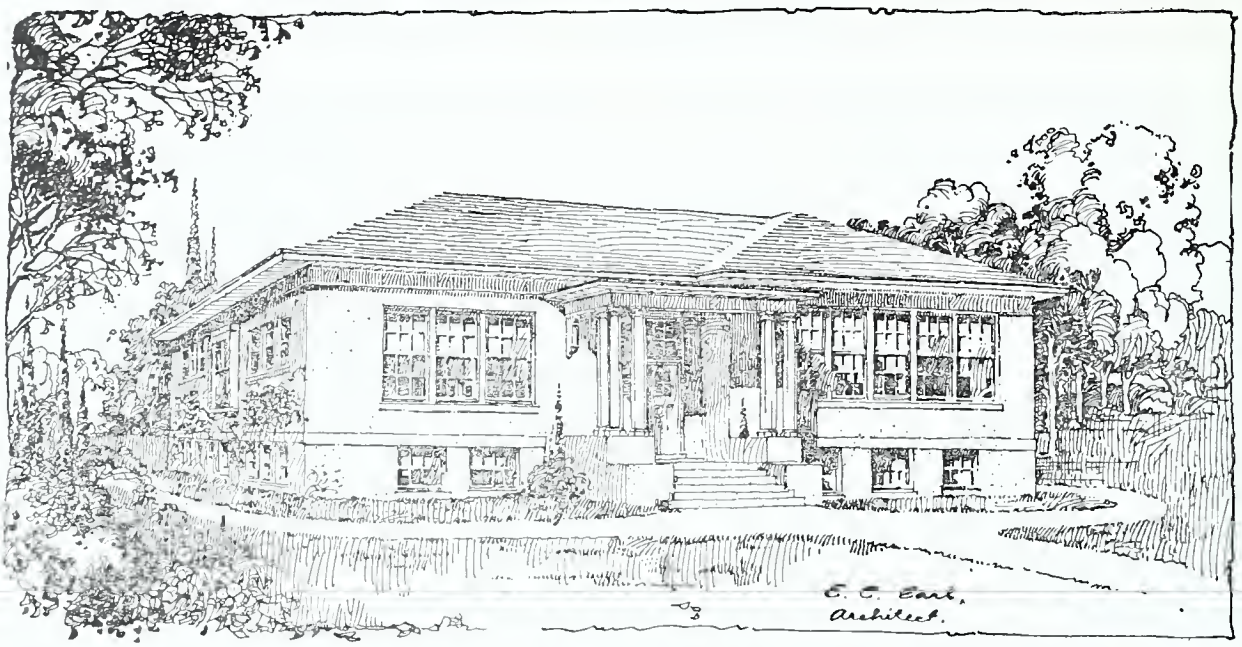


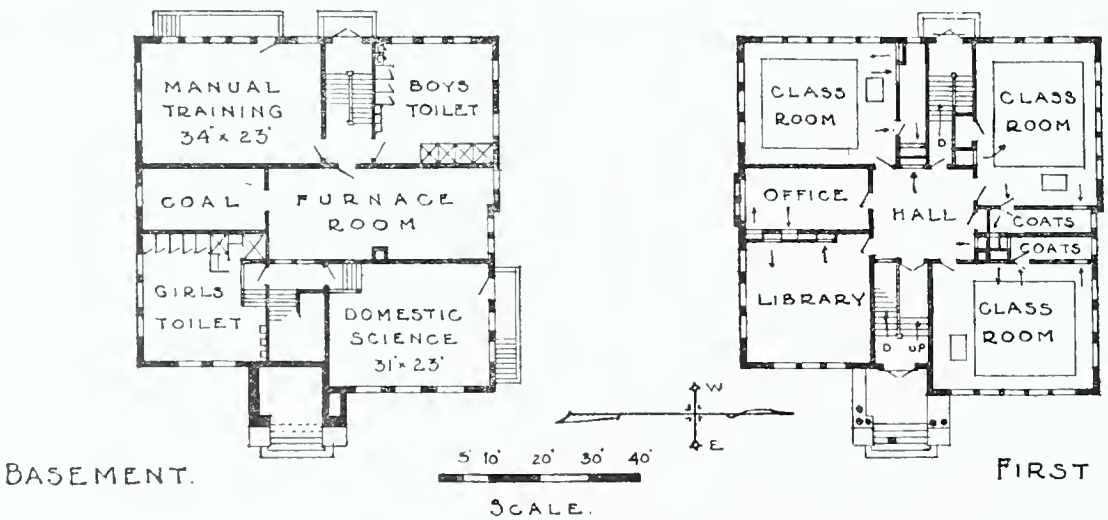


A THREE TEACHER SCHOOL BUILDING

THIS BUILDING HAS SEVERAL FEATURES WHICH ADAPT IT TO SERVE AS THE SOCIAL AND INTELLECTUAL MEETING PLACE FOR A PROGRESSIVE TOWN OR COUNTRY COMMUNITY. THE LIBRARY AND TEACHERS ROOM ARE SUITED FOR SMALL GATHERINGS AND THE LARGE HALL MAY BE USED FOR COUNTRY LIFE EXHIBITIONS THRU THE CHANGING SEASONS AND FOR EDUCATIONAL ENTERTAINMENTS. ALL THE PUPILS MAY BE BROUGHT TOGETHER HERE AT ANY TIME FOR SCHOOL EXERCISES. THE FRONT PORCH IS PLANNED FOR OPEN AIR GATHERINGS ON NATIONAL HOLIDAYS AND SUMMER EVENINGS. THE RAILING IS REMOVABLE SO THAT IT MAY BE USED FOR A DRILL PLATFORM AND STAGE, AS WELL AS FOR A SPEAKERS PLATFORM AND BAND STAND. SUCH A BUILDING IS NOT AN EXTRAVAGANCE.

SCHOOL DESIGN 31A	THE SCHOOLHOUSE	PLATE XVII



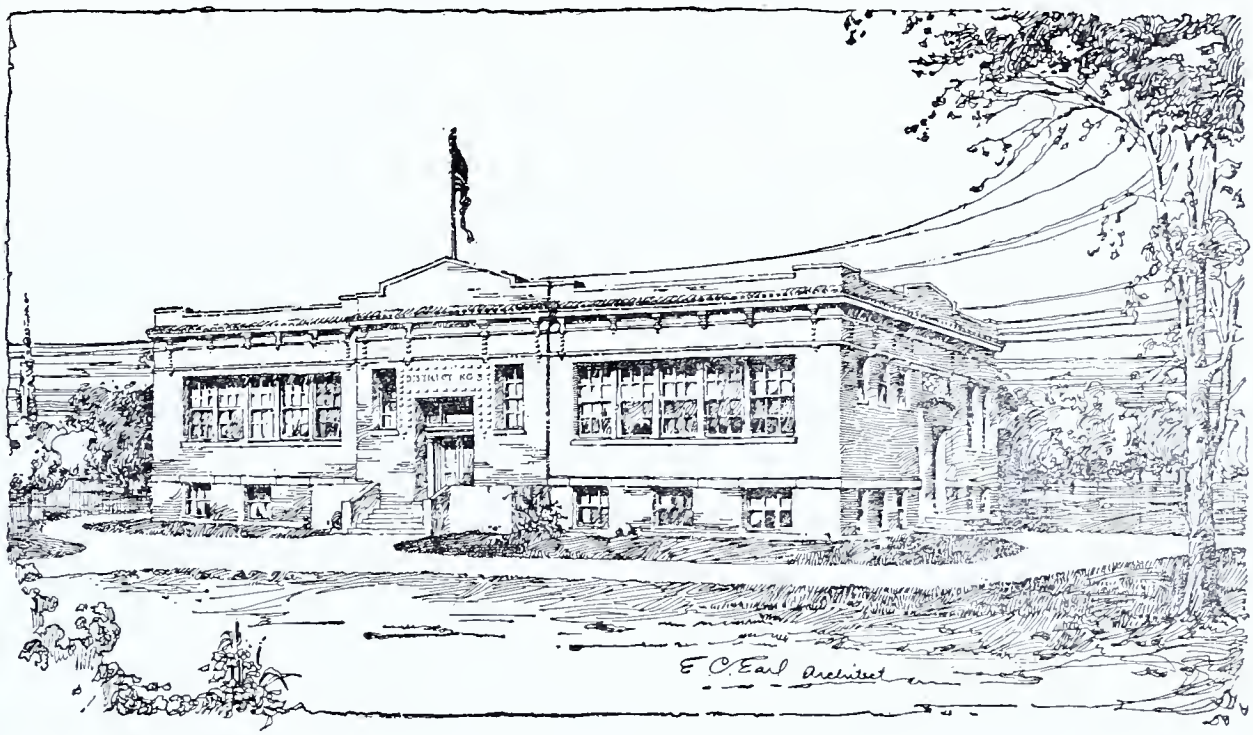


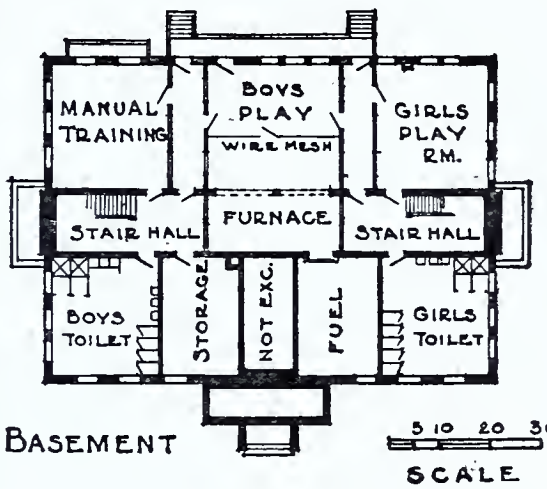
BASEMENT.

FIRST FLOOR.

A THREE ROOM SCHOOLHOUSE

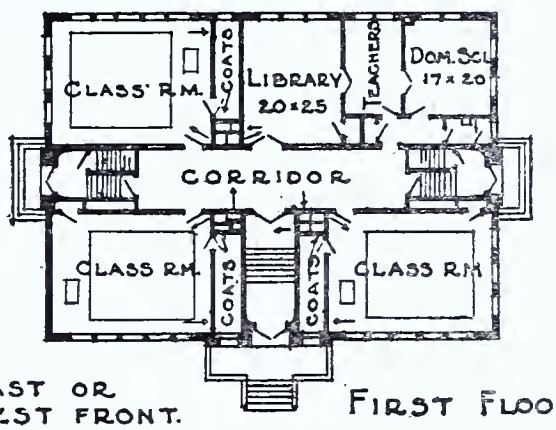
IN ADDITION THERE IS AN OFFICE AND A LIBRARY OR A FOURTH CLASS ROOM MAY BE HAD INSTEAD. MANUAL TRAINING, DOMESTIC SCIENCE, AND TOILET ROOMS ARE PLACED IN THE BASEMENT. THE BUILDING IS OF BRICK, STUCCOED, BASEMENT, OF CONCRETE, ROOF OF WOOD, ASPHALT, OR ASBESTOS SHINGLES, WITH TIN DECK THERE IS LITTLE WASTE ROOM AND THE EXTERIOR IS NOT EXPENSIVE. THIS PLAN WITH HIP ROOF, WIDE EAVES AND STUCCO FINISH IS WELL ADAPTED TO THE USE OF TILE FOR EXTERIOR WALLS.





BASEMENT

5 10 20 30
SCALE



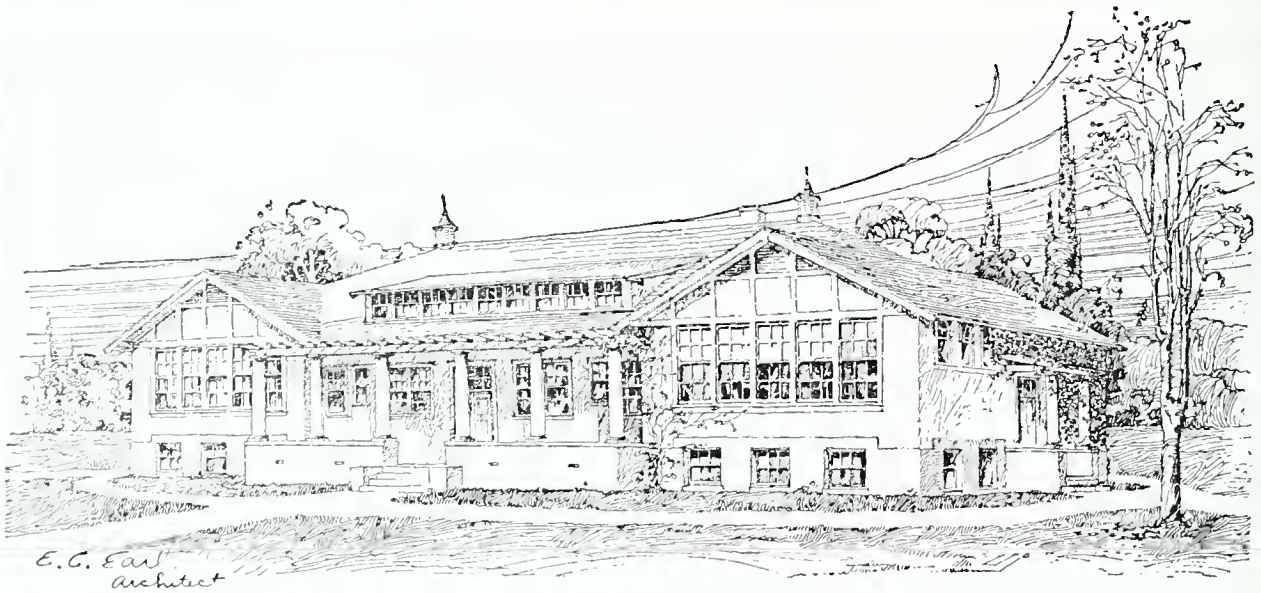
EAST OR WEST FRONT.

FIRST FLOOR

A THREE ROOM BRICK SCHOOLHOUSE.

OR A FOUR ROOM BUILDING WITHOUT LIBRARY AND DOMESTIC SCIENCE ROOM. A TEACHERS ROOM OR A SMALL SCHOOL LIBRARY MIGHT BE PLACED OPPOSITE THE FRONT ENTRANCE WITH THE FOUR CLASS ROOM PLAN. A SECOND STORY MAY BE ADDED LATER, MAKING AN EIGHT ROOM BUILDING WITH LIBRARY AND TEACHERS ROOM ON SECOND FLOOR. AS PLANNED THE OFFICE OR TEACHERS ROOM MAY BE USED FOR A LUNCH ROOM AND THE LIBRARY FOR A CLUB ROOM. THE TWO SIDE ENTRANCES HELP IN THE ORDERLY MANAGEMENT OF THE SCHOOL AND GIVE THE BOYS AND GIRLS SEPARATE ACCESS TO THE BASEMENT.

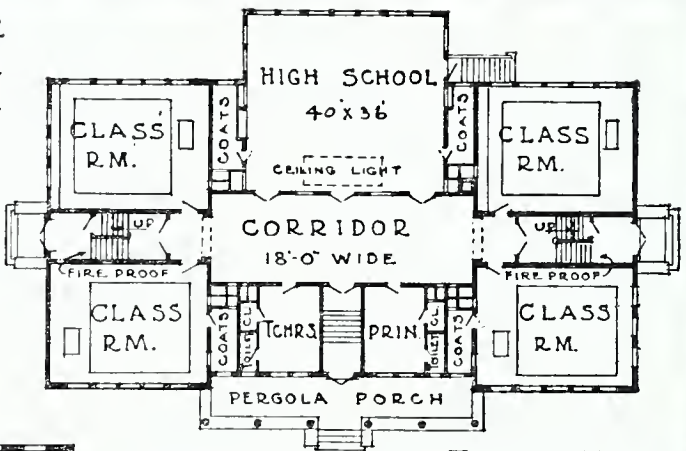
SCHOOL DESIGN 33	THE SCHOOLHOUSE	PLATE XIX



A SCHOOLHOUSE WITH FOUR CLASS ROOMS AND ASSEMBLY HALL

THESE ROOMS ARE ALL ON ONE FLOOR WITH PRINCIPAL'S AND TEACHERS ROOMS MAKING A COMPACT PLAN LEADING TO EFFICIENT WORK FOR ALL OF THE USUAL NEEDS OF THE SCHOOL.

THE BASEMENT IS EASILY REACHED FROM THE FIRST FLOOR AND FROM THE PLAYGROUND.

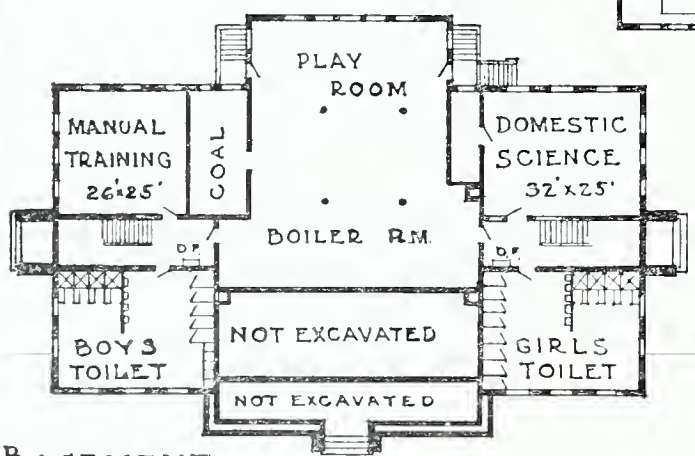


5' 10' 20' 30' 40'

SCALE

FIRST FLOOR

EAST OR WEST FRONT

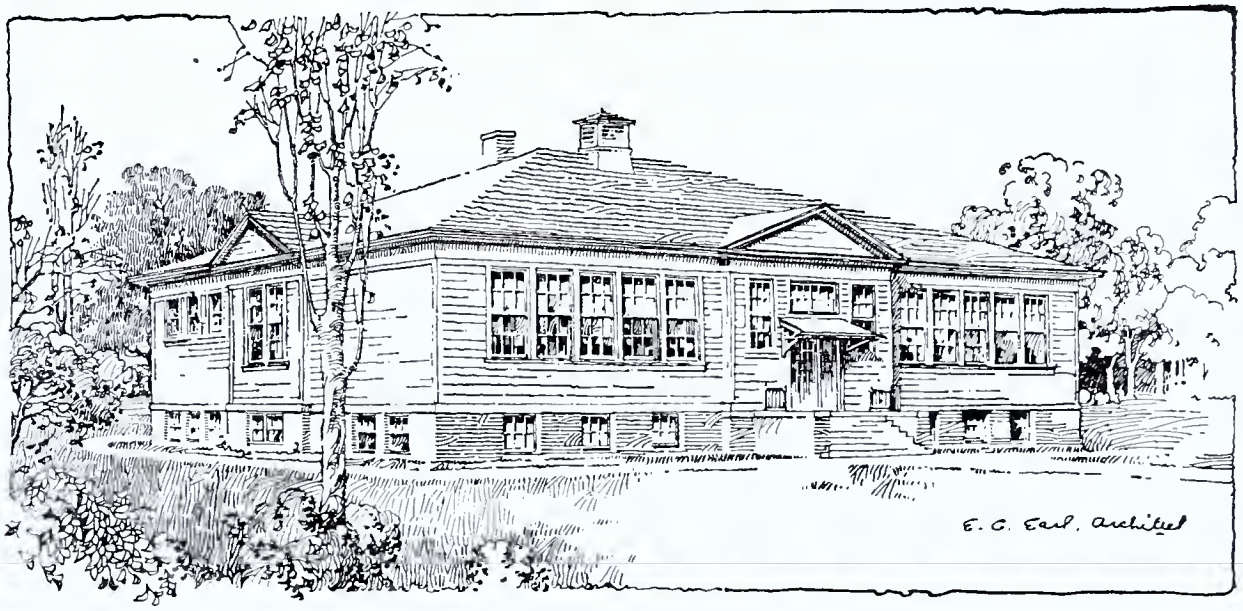


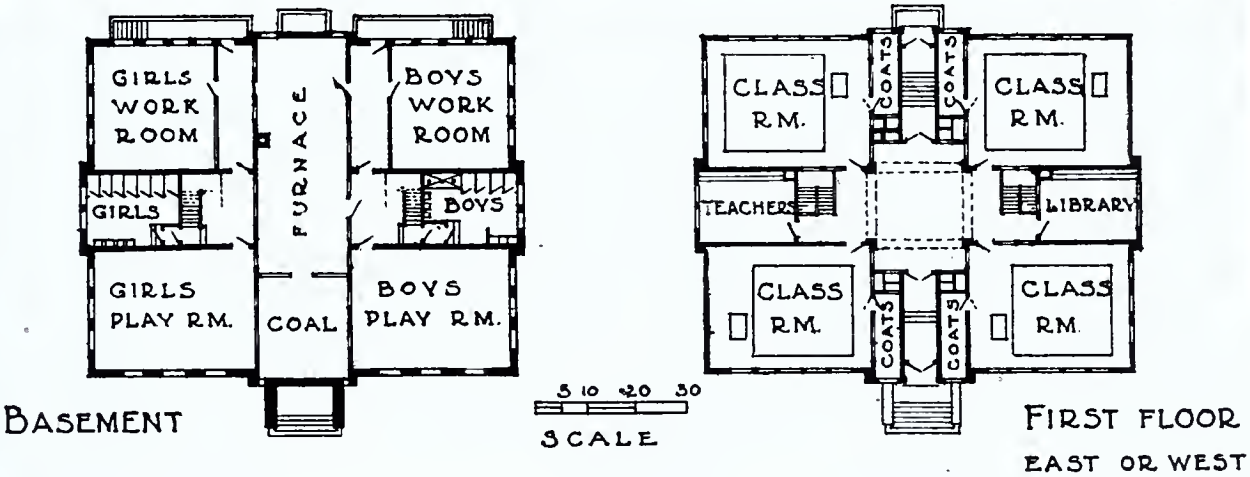
BASEMENT

IN THE SECOND STORY WHICH IS A HIGH ATTIC, ARE A LARGE LIBRARY AND CLUB ROOM. EITHER OR BOTH OF THESE MAY BE USED FOR RECITATION ROOMS IF DESIRED.

THE BUILDING IS OF FRAME CONSTRUCTION FINISHED OUTSIDE WITH STUCCO. IT MAY BE MADE VERY ATTRACTIVE WITH PROPER PLANTING.

SCHOOL DESIGN 41A	THE SCHOOLHOUSE	PLATE XX

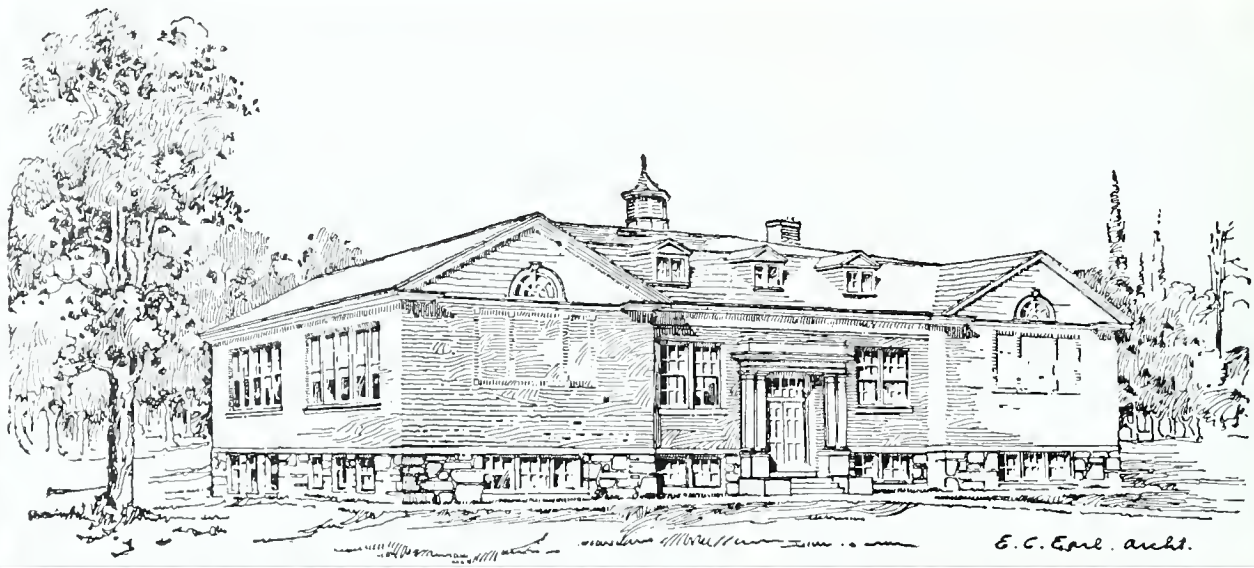


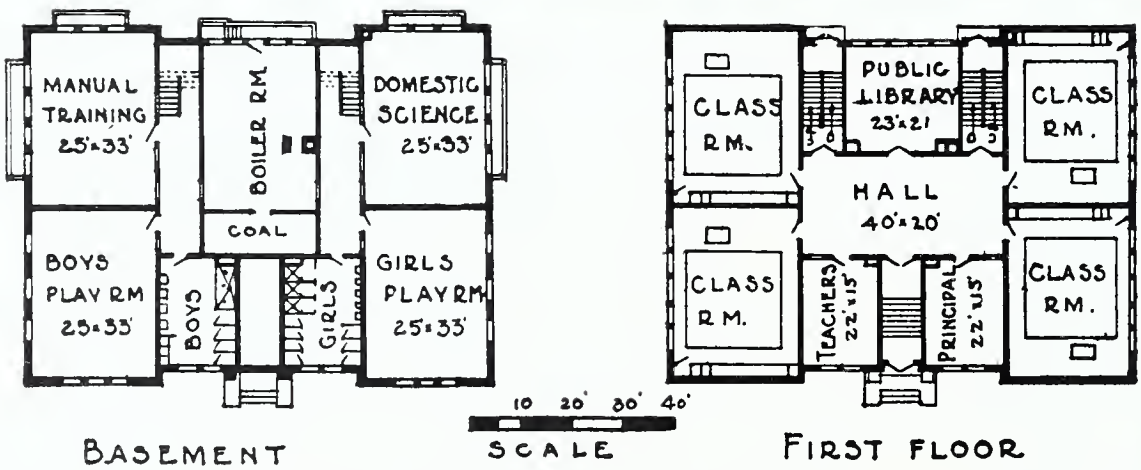


A BUILDING WITH FOUR CLASSROOMS.

THERE IS NOT MUCH UNNECESSARY EXPENSE IN THE CONSTRUCTION OF THIS BUILDING AND ALL OF THE ACTUAL NEEDS OF THE SCHOOL ARE PROVIDED FOR. THE LIBRARY AND TEACHERS ROOMS ARE EXPECTED TO SERVE AS CLUB ROOMS FOR BOYS AND GIRLS AS WELL AS AN OCCASIONAL MEETING PLACE FOR THE PARENTS AND THOSE INTERESTED IN THE SCHOOL. THE STAIRWAYS ARE CENTRALLY LOCATED BUT NOT IN THE WAY AND ARE NOT EXPENSIVE. THE ENTRANCE HALLS ARE WIDE AND WELL LIGHTED BY HIGH TRANSOMS AND GLASS DOORS.

SCHOOL DESIGN 42	THE SCHOOLHOUSE	PLATE XXI.





BASEMENT

FIRST FLOOR

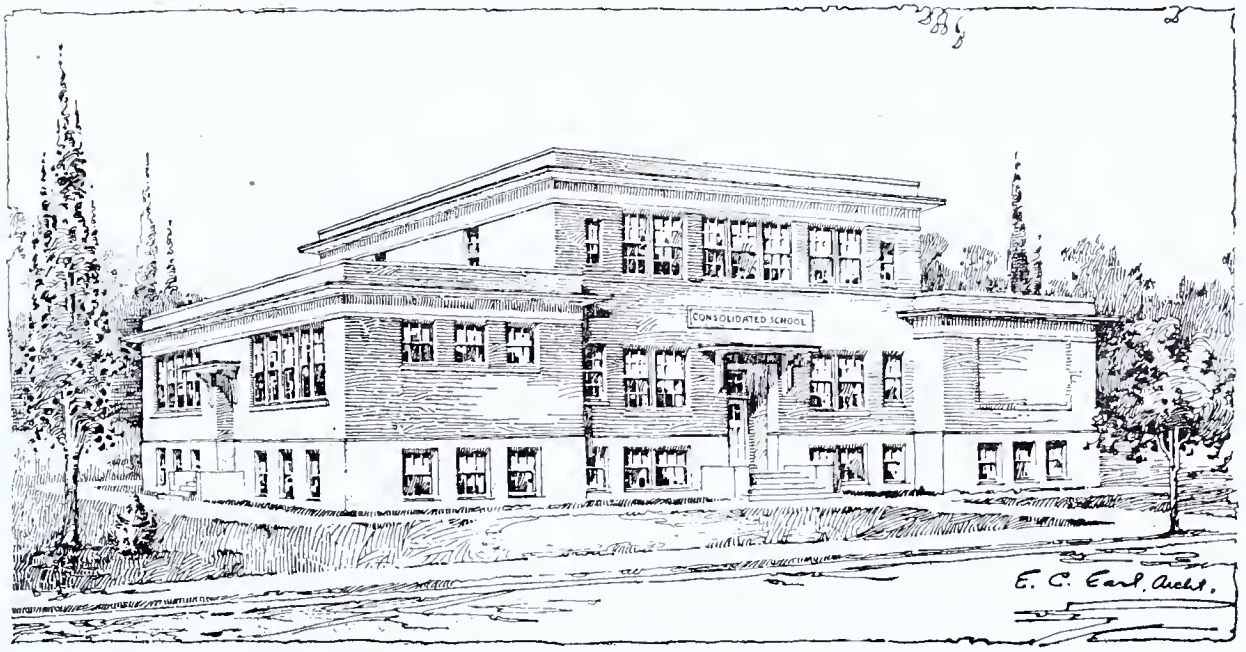
FOR NORTH OR SOUTH FRONT.

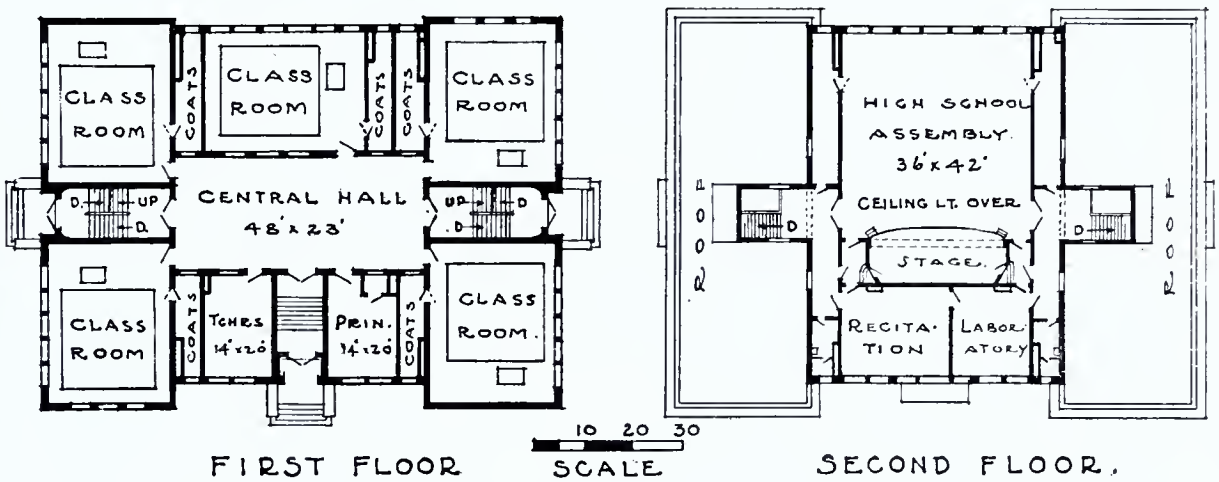
A FOUR ROOM SCHOOL

FOR THE ORDINARY NEEDS OF THE SCHOOL THERE IS SOME EXTRAVAGANCE IN THIS PLAN. THE LIBRARY IS EXPECTED TO SERVE THE WHOLE COMMUNITY. IF NOT SO REQUIRED IT MAY BE USED AS A FIFTH CLASS ROOM FOR 25 PUPILS OR FOR SPECIAL STUDIES AS MUSIC AND DRAWING. THE PRINCIPALS OR TEACHERS ROOM MAY BE USED AS A SCHOOL LIBRARY.

THE CLASS ROOM VENTILATION IN CONNECTION WITH COAT CABINETS SUPPOSES A FAN SYSTEM OF AIR CONTROL. THE BUILDING WOULD LOOK WELL WITH VINES AND LOW SHRUBBERY PARTLY COVERING THE END GABLES AND ENTRANCE PORTICO. CLASS ROOM WINDOWS SHOULD NOT BE SHADED

SCHOOL DESIGN 43	THE SCHOOLHOUSE	PLATE XXII.



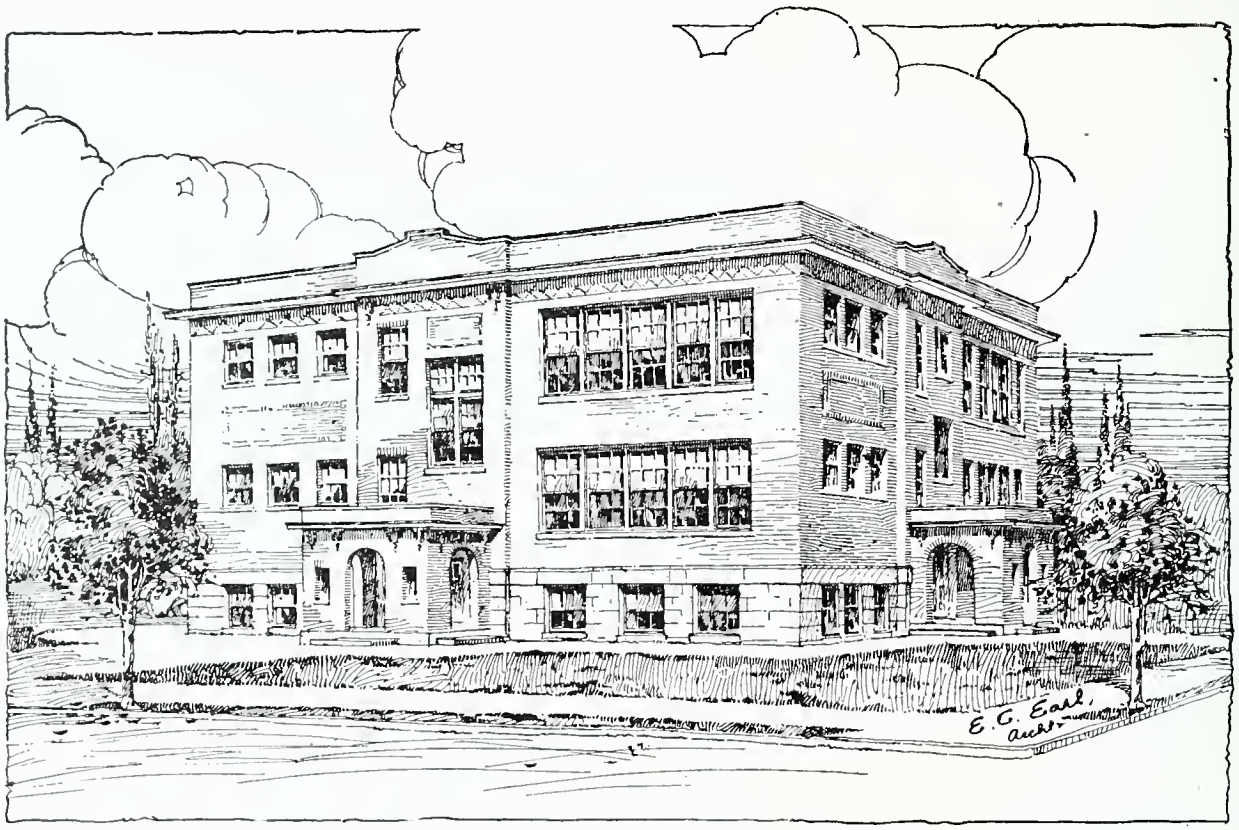


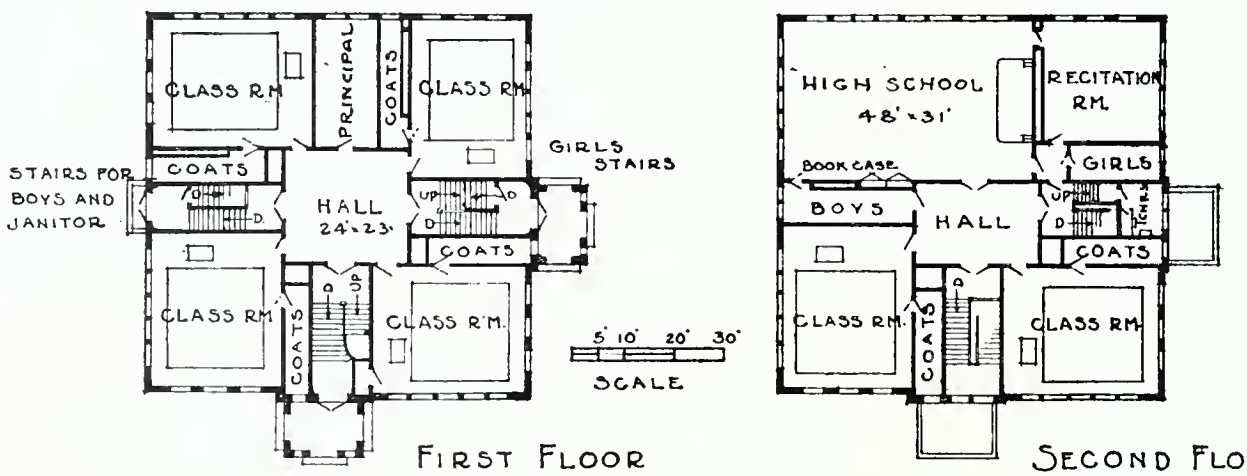
A BUILDING WITH FIVE CLASS ROOMS AND ASSEMBLY HALL.

THIS BUILDING MAY HAVE A GREATER FUTURE OR REMAIN AS HERE SHOWN. BY ADDING A SECOND STORY TO THE TWO SIDE WINGS IT MAY BE MADE INTO A NINE ROOM BUILDING WITH ASSEMBLY HALL. IT WILL LOOK WELL EITHER WAY. THE LARGE CENTRAL HALL ON THE FIRST FLOOR, IS A DESIRABLE FEATURE. IT IS LIGHTED BY HIGH WINDOWS AND TRANSOMS, AND MAY BE USED AS A PICTURE GALLERY OR FOR EXHIBITIONS IN CONNECTION WITH SPECIAL MEETINGS IN THE ASSEMBLY HALL.

ROOMS FOR PRINCIPAL AND TEACHERS ARE PROVIDED ON FIRST FLOOR. LOCKER AND TOILET ROOMS ON SECOND FLOOR AND USUAL ROOMS IN BASEMENT.

SCHOOL DESIGN 51A	THE SCHOOLHOUSE	PLATE XXIII.

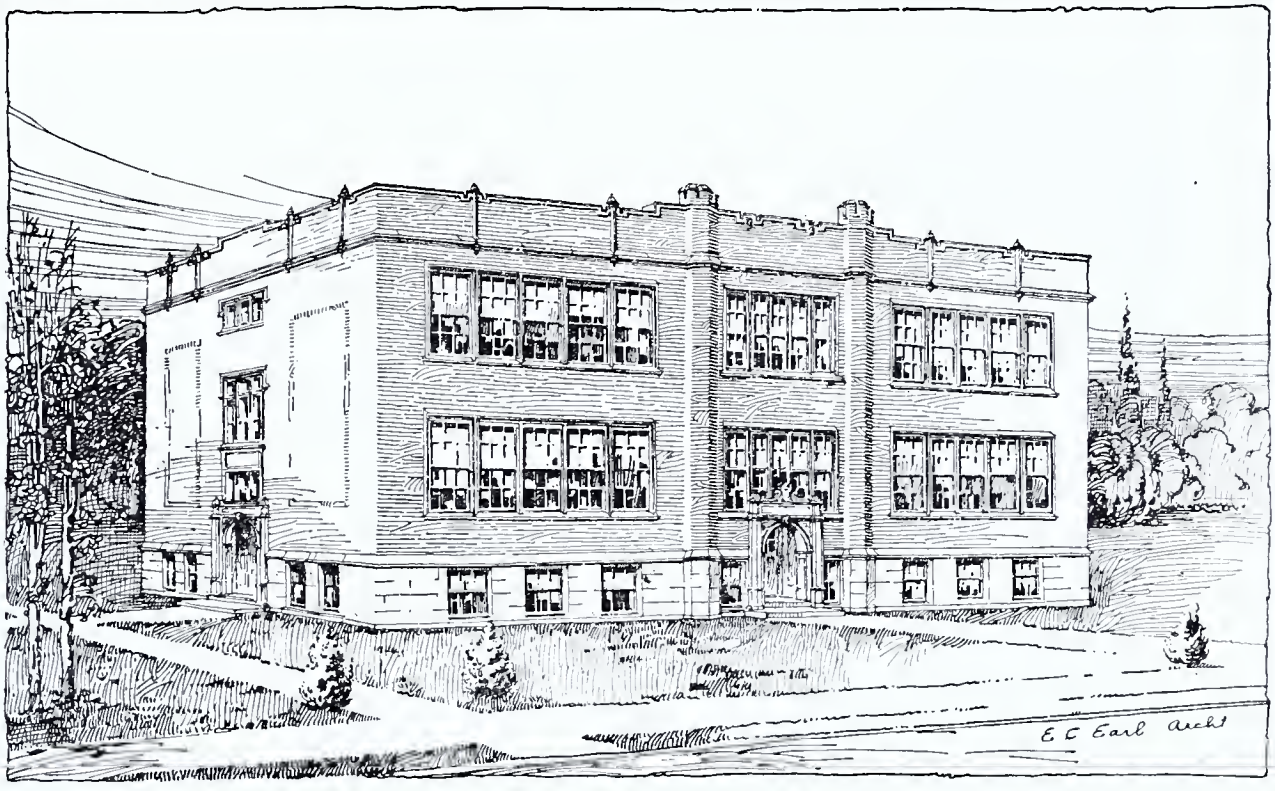


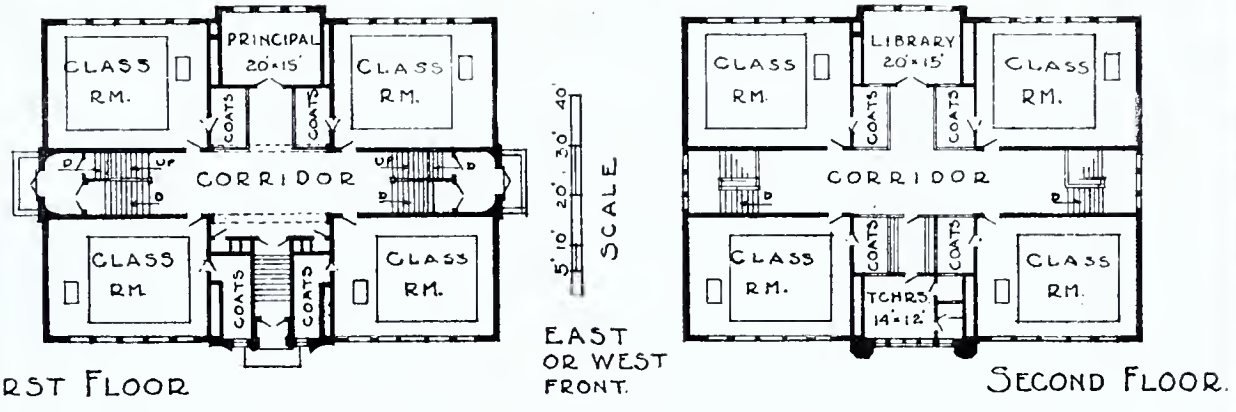


A HIGH SCHOOL BUILDING WITH SIX CLASS ROOMS.

THIS PLAN IS OF THE ROTARY TYPE WITH LIGHT FROM THE LEFT OF THE PUPILS AND WITH HIGH WINDOWS IN THE REAR OF EACH ROOM FOR VENTILATION AND SUNLIGHT FOR NORTH ROOMS. THERE IS A MINIMUM OF HALL SPACE BUT ENOUGH FOR SCHOOL WORK. SUFFICIENT STAIRWAYS ADD TO THE SAFETY AND ORDER OF THE SCHOOL. IF A LIBRARY AND LABORATORY ARE NEEDED FOR THE HIGH SCHOOL ONE OF THE CLASS ROOMS MAY BE USED FOR THIS PURPOSE. THE BUILDING MAY BE REMODELED INTO AN EIGHT ROOM GRADE SCHOOL WHEN THE NEW HIGH SCHOOL IS BUILT.

SCHOOL DESIGN 61A	THE SCHOOLHOUSE	PLATE XXIV





FIRST FLOOR

EAST OR WEST FRONT.

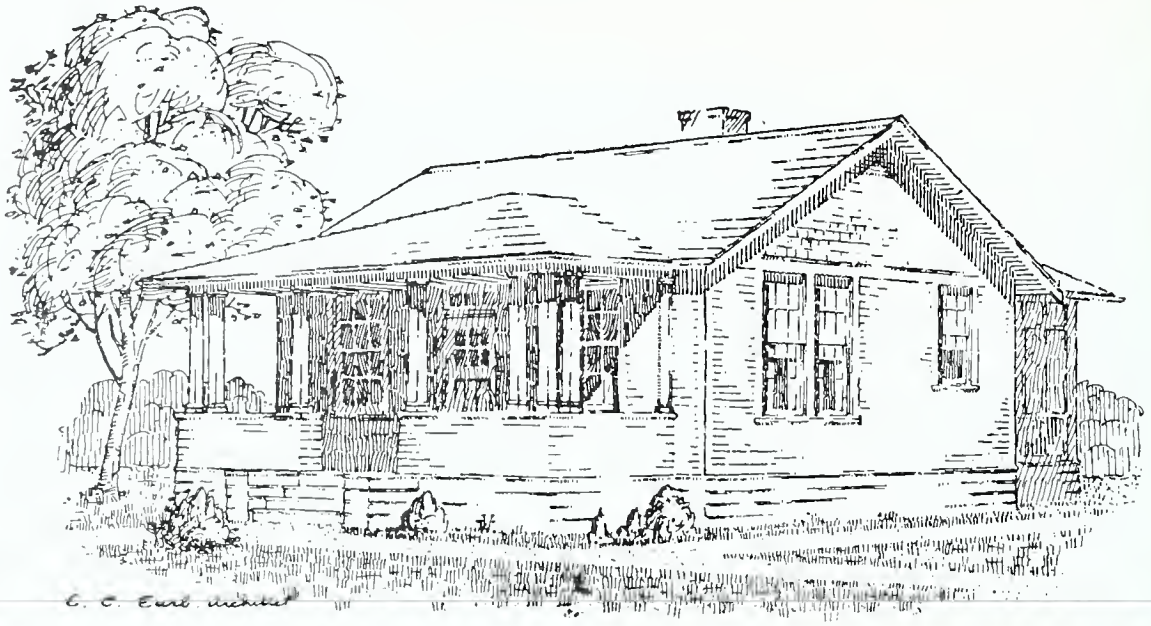
SECOND FLOOR.

A GRADE SCHOOL OF EIGHT CLASS ROOMS.

THIS BUILDING IS OF THE CITY SCHOOL TYPE, BUT IS JUST AS WELL ADAPTED TO ANY COMMUNITY REQUIRING A TWO STORY SCHOOL BUILDING. GOTHIC ARCHITECTURE HAS COME TO BE REGARDED AS ESPECIALLY APPROPRIATE FOR LARGE SCHOOLHOUSES.

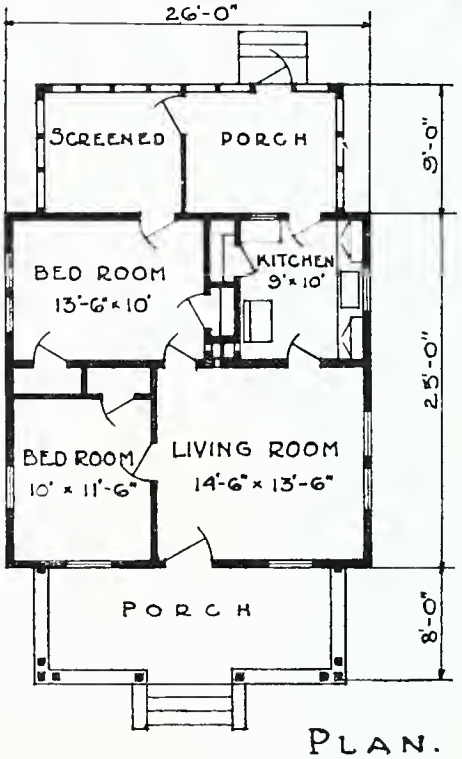
INDIRECT STEAM HEATING SHOULD BE USED WITH FAN VENTILATION. THE WALLS FOR SIX OF THE COAT ROOMS ARE 7'-6" HIGH WITH BURLAP PANELS ON CORRIDOR SIDE, AND WITH MOULDED CORNICE. THE CASES IN PASSAGE TO TEACHERS ROOM ARE FOR SUPPLIES AND SCHOOL BOOKS. IN THE BASEMENT ARE WORK ROOMS FOR BOYS AND GIRLS, BOILER AND FUEL ROOMS AND TOILET ROOMS.

SCHOOL DESIGN 81.	THE SCHOOLHOUSE	PLATE XXV.



A Four Room Home.

This is a convenient four room house. The porches make it a desirable home for those who like life out of doors with the rear porch it is, in fact, a six room house from April to October. The rooms are all of good size and there are more than the usual number of closets.

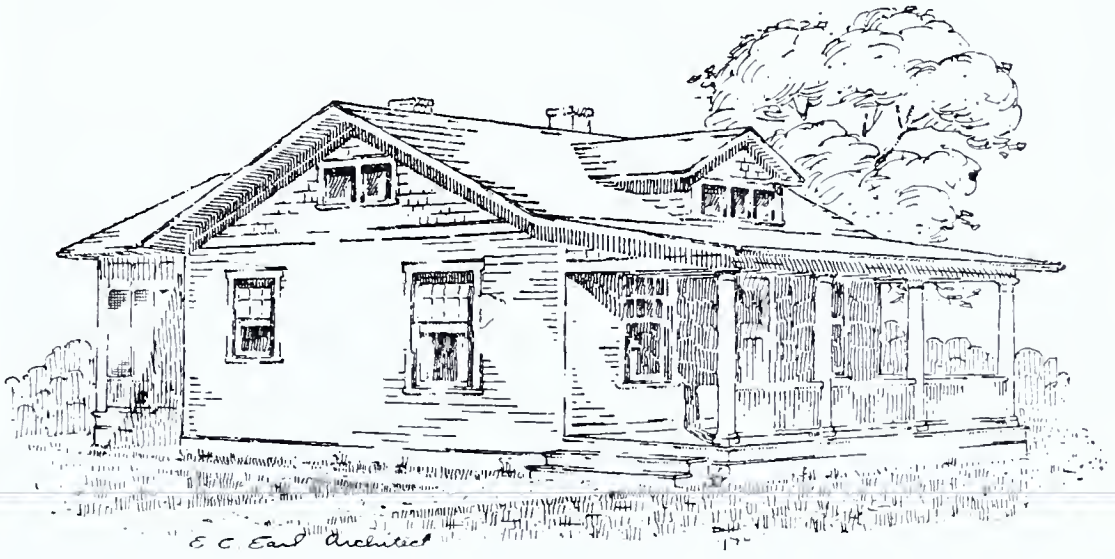


5' 10' 15' 20

SCALE 1/16 = 1'-0"

PLAN.

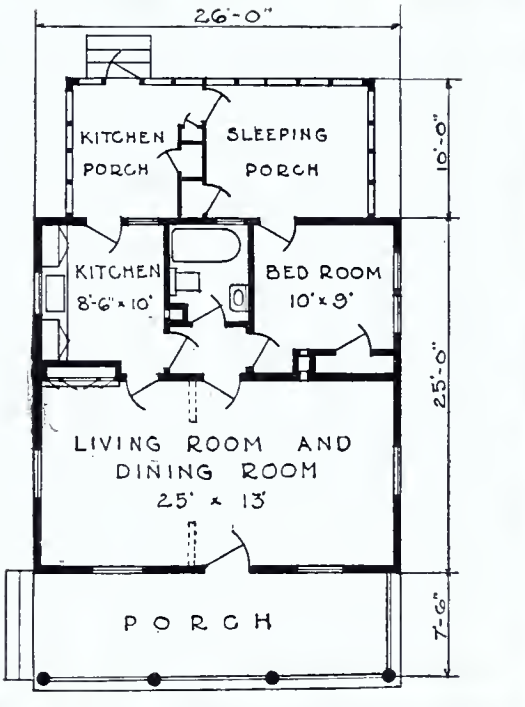
RESIDENCE DESIGN 401	THE SCHOOLHOUSE.	PLATE XXVI



A Three Room Home

The living room and dining room are shown as one large room this gives the effect of a large living room so much desired in high cost homes. However a partition with cased opening and portieres may be used to divide this room into two separate rooms.

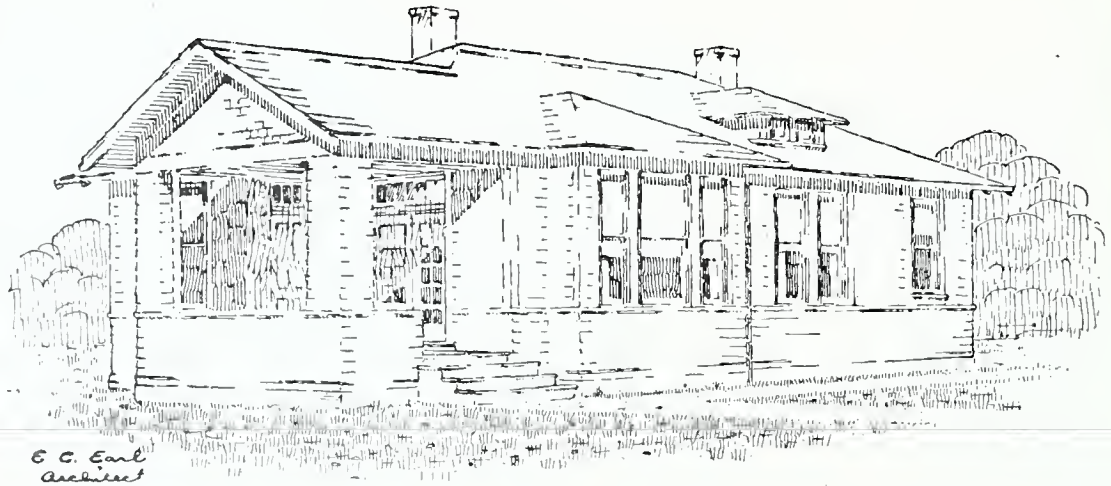
The rear porch adds a second bed room and a dining room in the summer, or it may be used almost the entire year by inclosing with storm sash. The bath room has a large ventilator with glass top.

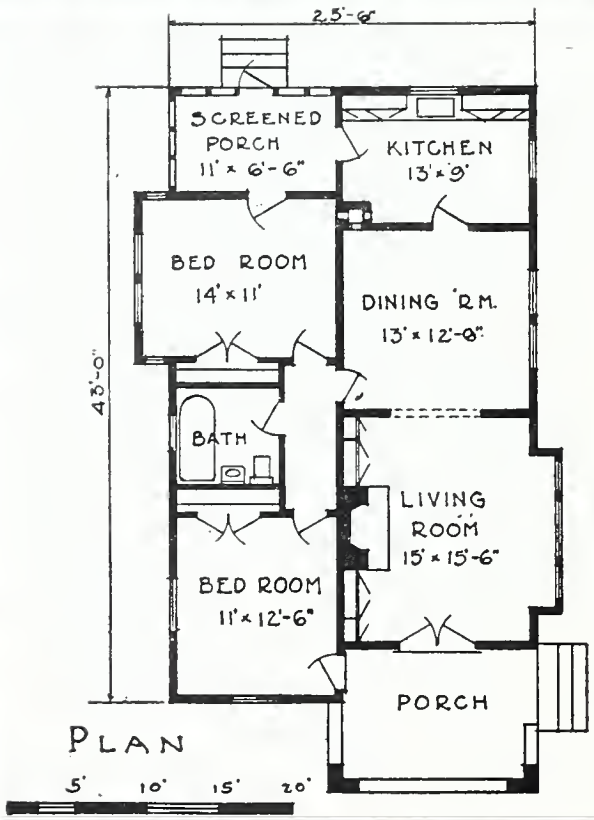


PLAN

SCALE 1/16" = 1'-0"

RESIDENCE DESIGN 301	THE SCHOOLHOUSE.	PLATE XXVII





A Five Room Home

This house is of the bungalow type, planned for comfort and service. If the front porch is screened and the double front doors to the living room are left open in the summer, the porch, living room and dining room become much the same as one large living room.

The cases and cupboards in the kitchen take the place of a pantry. There is space in the kitchen for a table and kitchen cabinet.

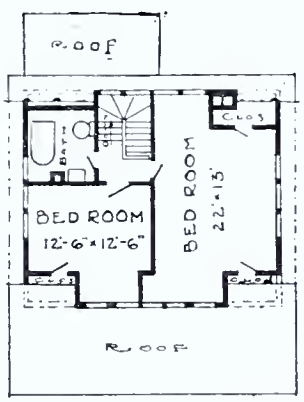
The foundations are concrete or brick piers and the siding extends down to grade.

RESIDENCE DESIGN 501	THE SCHOOLHOUSE.	PLATE XXVIII

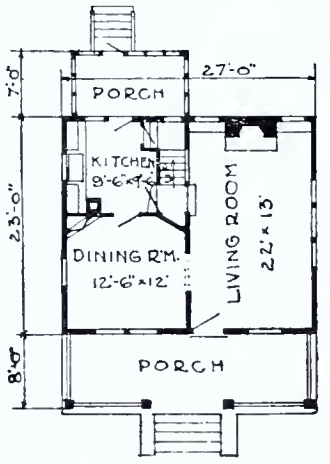
A Five Room Home.

THE "STORY AND ONE HALF" HOUSE IS PROBABLY THE MOST ECONOMICAL OF ANY TO BUILD. THIS PLAN PROVIDES A VERY GOOD LIVING ROOM AND A CONVENIENT DINING ROOM AND KITCHEN. THE BASEMENT IS SO NEAR THAT FEW STORES, ONLY, NEED BE KEPT IN THE CUPBOARDS.

THE BED ROOMS ARE EASILY REACHED FROM BOTH LIVING ROOM AND KITCHEN. THEY ARE LARGE AND WELL LIGHTED AND VENTILATED. THE LOUVERS IN THE GABLES KEEP THE ATTIC SPACE COOL IN SUMMER.



SECOND FLOOR

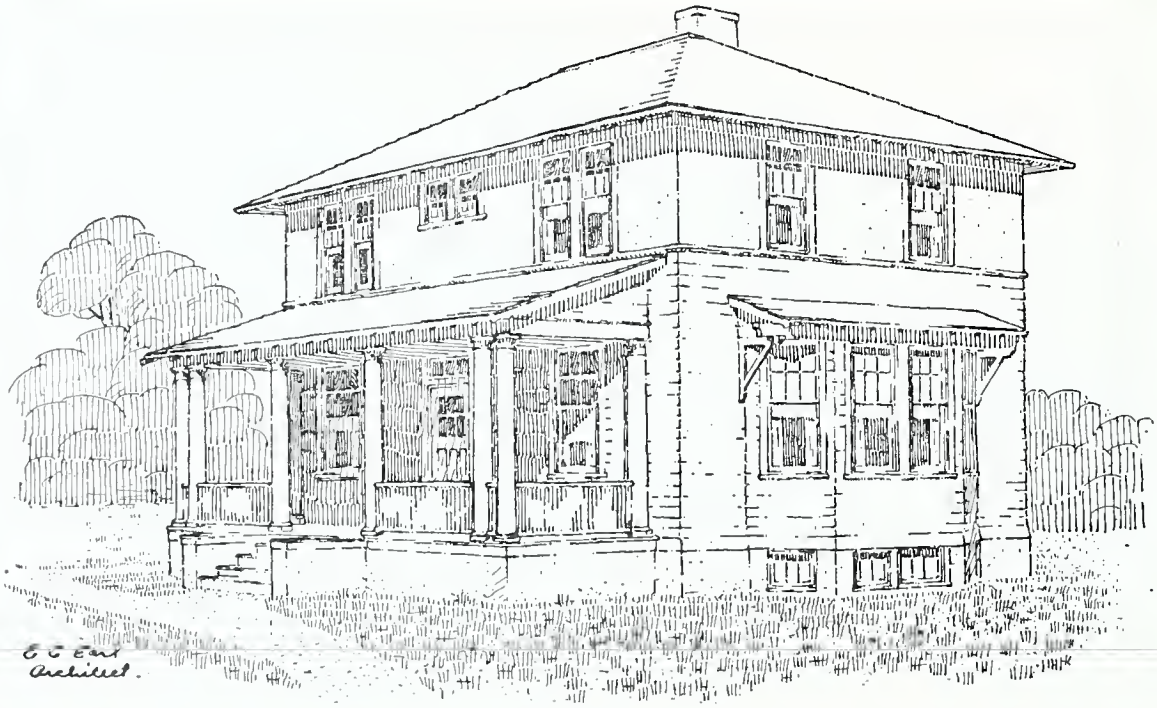


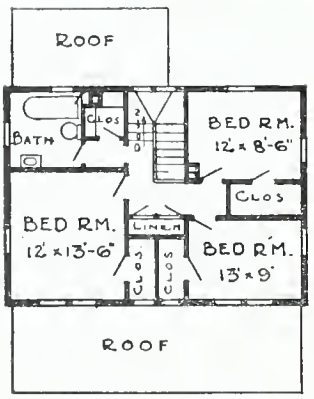
FIRST FLOOR

5' 10' 15' 20' 25'

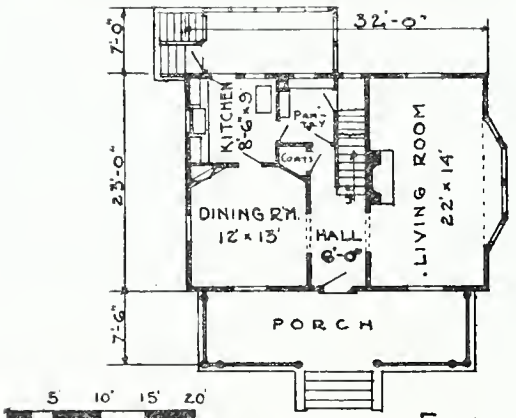
SCALE

RESIDENCE DESIGN 551	THE SCHOOLHOUSE.	PLATE XXIX





SECOND FLOOR



FIRST FLOOR

A Six Room Home

THE SQUARE HOUSE WITH HIP ROOF OFFERS FEW OBSTACLES TO THE BUILDER. THERE IS NEARLY EVERY CONVENIENCE IN THIS PLAN THE CENTRAL HALL IS NOT MUCH LARGER THAN IS REQUIRED FOR A VESTIBULE AND IT GIVES ACCESS TO ALL THE ROOMS. OUTSIDE, THE SECOND STORY COULD VERY WELL BE FINISHED WITH SHINGLES INSTEAD OF STUCCO

RESIDENCE DESIGN 651	THE SCHOOLHOUSE.	PLATE XXX